

DEPARTMENT OF AGRICULTURE
CANADA

REPORT

OF THE

VETERINARY DIRECTOR GENERAL

AND

LIVE STOCK COMMISSIONER

J. G. RUTHERFORD, C.M.G.

For the Year ending March 31, 1912

PRINTED BY ORDER OF PARLIAMENT



OTTAWA

PRINTED BY C. H. PARMELEE, PRINTER TO THE KING'S MOST
EXCELLENT MAJESTY

1912



REPORT OF THE VETERINARY DIRECTOR GENERAL

AND

LIVE STOCK COMMISSIONER.

HEALTH OF ANIMALS AND LIVE STOCK BRANCHES.

OTTAWA, March 31, 1912.

SIR.—I have the honour to present my report as Veterinary Director General and Live Stock Commissioner for the year ending March 31, 1912.

The unsatisfactory conditions referred to in my report of last year as adversely affecting, and to some extent retarding the development of the live stock industry in Canada, still continue, some of them in fact being now more serious than they were a twelve month ago.

There has been during the past year no cessation of activity in the various lines of work conducted under my supervision.

The Health of Animals Branch has continued its efforts to protect the live stock of the country from disease, not only by guarding against its introduction from abroad, but by preventing the spread of infection already existing among Canadian herds and flocks.

While in the summary of the year's work there are not wanting illustrations of the fact that in the warfare against disease, in which this Branch is constantly engaged, 'eternal vigilance is the price of safety,' there are also ample and gratifying evidences that the efforts made in the past have resulted in bringing under reasonable control most of the maladies affecting the live stock of Canada.

While much yet remains to be done before this Branch can be looked upon as either fully organized or properly equipped, I feel that I am justified in saying that the year just past will, in point of progress and achievement, compare very favourably with any of those during which this work has been under my supervision.

The Meat Inspection service has been steadily growing more efficient.

The progress achieved by the Live Stock Branch in the all important work entrusted to its charge has, though still leaving much to be desired, been decidedly more satisfactory than for several years previous.

The fact that the Canadian Live Stock industry is at present passing through a somewhat critical period renders the increased and increasing usefulness of this Branch an even greater source of satisfaction than it would be were the conditions normal. There is, I am convinced, every ground for the belief that with the interest now evinced in its work and the liberal financial support which that work so unquestionably deserves, this comprehensive Branch of your Department will, from this time forward, demonstrate its varied usefulness in a much more striking and emphatic manner than has been possible in the past.

Each of the more important phases of the work of these Branches is categorically dealt with in the present report and any further remarks of an introductory character are therefore unnecessary.

HEALTH OF ANIMALS BRANCH.**HOG CHOLERA.**

Reference to the accompanying statistics will show that the outbreaks of Hog Cholera dealt with in the last twelve months have been both more numerous and more extensive than those recorded during any like period for some considerable time past. While, at first sight, this may be thought discouraging, a closer scrutiny of the facts connected with these outbreaks will convince the intelligent observer that the situation, though undoubtedly grave, is not nearly as serious as the figures might be taken to indicate. In the first place, it is evident that the disease has now, nowhere in Canada, a permanent and constant habitat, such as it undoubtedly had at one time in the Counties of Essex and Kent in the province of Ontario. Secondly, it will be seen that the strict and systematic enforcement of the present quarantine regulations has been eminently successful in preventing the introduction of direct infection from the United States, where in many different localities, the disease is constantly in evidence, and causes great loss to farmers and others engaged in the hog industry. Our experiences during the past year furnish very strong if still only circumstantial evidence in support of the views advanced in my previous reports, that the great majority of the outbreaks now dealt with by our officers are traceable to the consumption by garbage-fed hogs of uncooked hog products originating in countries where the disease exists.

In support of this contention, I have thought it advisable to publish herewith a special report, furnished at my request by Dr. Moore, Chief Travelling Inspector of the Health of Animals Branch, under date of November 13, 1911. Your attention is also directed to a paper on the subject read during the present month before the Veterinary Association of the province of Manitoba, by Dr. C. D. McGilvray, the officer in control of the work of the Branch in Manitoba, and which will be found in his individual report.

A thoughtful and unprejudiced perusal of these two documents should, I am convinced lead any one with an open mind to the conclusion that the prevalence of the disease in the districts referred to may much more reasonably be attributed to the consumption of infected pork and pork products than to any other possible source.

For several years back I have been anxious to demonstrate the accuracy of this theory by means of a series of carefully conducted feeding experiments. Owing however to lack of proper facilities for the isolation of experimental animals at the Biological Laboratory and the consequent risk of introducing the disease to the valuable herds of swine kept in the vicinity, nothing has, as yet, been done in this connection. I sincerely trust that the furnishing of proper equipment for work of this kind will be no longer delayed and that my successor in office may thus be given an opportunity of testing the soundness of the views now advanced.

In the Dominion 4,249 hogs were destroyed as diseased at a cost of \$23,446.51 in compensation.

ONTARIO.

Sixty-four outbreaks of hog cholera occurred in Ontario in which 1,499 hogs, valued at \$12,382 were destroyed in the undermentioned districts at a cost of \$8,200.54 in compensation.

Nineteen premises were also quarantined on suspicion, involving the control of 1,266 hogs.

Two hogs, valued at \$16 were destroyed for purposes of examination, but no evidence of hog cholera was found.

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District.	Number of outbreaks.	Hogs destroyed.
Algoma	16	319
Essex	8	112
Kent	10	199
Thunder Bay and Rainy River	29	849
Welland	1	20
Total	64	1,499

MANITOBA.

Sixty-two outbreaks of hog cholera occurred in Manitoba in which 2,218 hogs, valued at \$18,538 were destroyed in the undermentioned districts at a cost of \$12,358.52 in compensation.

Twelve premises were also quarantined on suspicion, involving the control of 278 hogs.

District.	Number of outbreaks.	Hogs destroyed.
Macdonald	12	130
Provencher	25	579
Selkirk	13	597
Winnipeg	12	912
Total	62	2,218

SASKATCHEWAN.

Three outbreaks of hog cholera occurred in Saskatchewan, in which 158 hogs, valued at \$1,461 were destroyed in the undermentioned districts at a cost of \$974 in compensation.

Five premises were also quarantined on suspicion, involving the control of 167 hogs.

District.	Number of outbreaks.	Hogs destroyed.
Moosajaw	2	77
Saskatoon	1	81
Total	3	158

ALBERTA.

Sixteen outbreaks of hog cholera occurred in Alberta in which 316 hogs, valued at \$2,258.20 were destroyed in the undermentioned districts at a cost of \$1,505.45 in compensation.

Eight premises were also quarantined on suspicion, involving the control of 86 hogs.

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One hog valued at \$15 was destroyed for purposes of examination, at a cost of \$10, but no evidence of hog cholera was found.

District.	Number of outbreaks.	Hogs destroyed.
Calgary.....	10	155
Medicine Hat.....	6	161
Total.....	16	316

BRITISH COLUMBIA.

Two outbreaks of hog cholera occurred in British Columbia in which 58 hogs, valued at \$513 were destroyed in the undermentioned districts at a cost of \$342 in compensation.

Three premises were also quarantined on suspicion, involving the control of 202 hogs.

District.	Number of outbreaks.	Hogs destroyed.
Nanaimo.....	1	50
Vancouver.....	1	8
Total.....	2	58

TUBERCULOSIS.

The attitude of the Department with reference to Bovine Tuberculosis has not undergone any serious change during the year just past. I had hoped that, after the publication in 1910, of the report of the International Commission on Bovine Tuberculosis and the subsequent wide distribution of the special farmers' bulletin relating to the disease, which was also prepared by that body, public opinion would ere this time, have warranted the Department in adopting a definite and comprehensive policy, having for its object the present control and ultimate eradication of the malady.

So far, however, although possibly to some extent, owing to circumstances having only an incidental bearing on the subject, it has not been possible to either officially formulate or put in operation the policy recommended by the Commission, against which, it is encouraging to note, no hostile criticism has been at any time directed.

As the Commission has, for the present, practically concluded its labours, I did not deem it necessary to call any meetings during the year, except on one occasion, when a favourable opportunity having been presented by the holding of the annual convention of the American Veterinary Medical Association in Toronto in August last, the special pamphlet above referred to was, prior to publication, subjected to the careful scrutiny and revision of the members.

At the meeting of the National Live Stock Association which was held in Ottawa in February last, it fell to my lot to address the members on the subject of Bovine Tuberculosis, and it may be noted that among the resolutions passed by that body the following is included:—

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RESOLVED, that in the opinion of this Association, it is eminently desirable that the Dominion Government should, at the earliest possible date, suggest a policy having for its object the control, and as far as possible the eradication of Bovine Tuberculosis, on the lines recommended in the report of the International Commission.

I sincerely trust that in the near future it will be found possible to embody in the effective regulations of the Department the recommendations of the Commission which, as is shown by the resolution quoted above, are generally approved by the leading stock owners of the Dominion. :

440 cattle were tested on being imported into Canada, 14 of which re-acted, 9 were classed as suspicious, and 417 proved healthy.

443 cattle were tested for export, 18 of which reacted, 4 were classed as suspicious, and 421 proved healthy.

2,542 cattle were tested by private practitioners, 269 of which reacted, 35 were classed suspicious, and 2,233 proved healthy.

All reactors were permanently earmarked by a veterinary inspector in cases where the owner did not voluntarily destroy them.

GLANDERS.

The present policy of the Department with regard to Glanders, has, since its adoption in 1904, been attended with most gratifying results in every part of the Dominion. While owing to special conditions which have been repeatedly referred to in my previous annual reports, the success which has attended its operation has been less clearly apparent in Saskatchewan than in any of the other provinces, this circumstance should not be permitted to obscure the very evident fact that, even there, the methods now in use, have been productive of excellent results.

A careful analysis of the figures relative to Glanders in Saskatchewan during the past seven years will I think, satisfy any one interested in the subject and familiar with the previous history of the disease in that province and the adverse conditions there met with by our officers, that the results derived from the enforcement of the present policy are such as more than warrant its continuance.

As a practical and effective means of enabling the veterinary inspector in the field to form an accurate and reliable diagnosis of glanders, the mallein test unquestionably still holds first place, although in making this statement I do not wish to be understood as reflecting in any way, upon the newer and possibly more scientific tests which, from their very delicacy and exactitude, can be used to much better advantage in the research laboratory than in the stable.

In one particular only would I recommend a change in the existing regulations. As a result of the very considerable increase which has taken place in the price of horses since the inauguration of the present policy, the scale of compensation now paid is altogether too low, and should, in the public interest, be raised to an extent reasonably proportionate to the actual value of the animals destroyed.

In this connection it should be borne in mind that if the present policy continues to be carefully and conscientiously enforced, the expenditures for compensation will, as in the past, show a constant and regular decrease, thus eliminating the possibility of any largely augmented outlay on account of this particular disease.

DOMINION.

853	{	7	killed on inspection.	}	Valued at \$116,160, at a cost \$77,439.95.
		774	" at 1st test.		
		66	" at 2nd test.		
		5	" at 3rd test.		
		1	" at 5th test.		

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291 showed clinical symptoms.

31,434 horses were tested with mallein of which 846 reacted and were destroyed. Of the 846 reactors, 284 showed clinical symptoms of glanders at or during the test. 514 horses are under control for retest.

Of the above 853 horses slaughtered, 22 were killed without compensation as being diseased when imported into Canada.

PRINCE EDWARD ISLAND.

Three horses were tested and proved to be healthy.

NOVA SCOTIA.

Thirty horses were tested and proved to be healthy.

NEW BRUNSWICK.

7 { 7 killed at 1st test. } Valued at \$825, at a cost
of \$550.

Three showed clinical symptoms.

On hundred and fifty-three horses were tested with mallein, of which 7 reacted and were destroyed. Of the 7 reactors, 3 showed clinical symptoms of glanders at or during the test.

Eight horses are under control for retest.

The 7 horses slaughtered were in the electoral district of Sunbury and Queens.

QUEBEC.

19 { 3 killed on inspection. } Valued at \$2,450.
16 " at 1st test. { At a cost of \$1,633.33.

Eleven showed clinical symptoms.

Three hundred and eighty-three horses were tested with mallein, of which 16 reacted and were destroyed. Of the 16 reactors, 8 showed clinical symptoms of glanders at or during the test.

Seven horses are under control for retest.

Of the 19 horses slaughtered—

19 { 5 were in the electoral district of Joliette.
2 " " Berthier.
3 " " Labelle.
1 was " " Yamaska.
1 " " Drummond and Arthabaska.
6 were " " Portneuf.
1 was " " Hochelaga.

ONTARIO.

4 { 4 killed at 1st test. } Valued at \$600.
At a cost of \$400.

Four showed clinical symptoms.

One thousand and nine horses were tested with mallein, of which 4 reacted and were destroyed. Of the 4 reactors, all showed clinical symptoms of glanders at or during the test.

Twenty horses are under control for retest.

The 4 horses slaughtered were in the electoral district of Nipissing.

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MANITOBA.

38 { 1 killed on inspection. } Valued at \$5,085.
 { 35 " at 1st test. } At a cost of \$3,389.98.
 { 2 " at 2nd test. }

Ten showed clinical symptoms.

Five thousand and fifty-six horses were tested with mallein, of which 37 reacted and were destroyed. Of the 37 reactors 9 showed clinical symptoms of glanders at or during the test.

Fifty-five horses are under control for retest.

Of the 38 horses slaughtered—

38 { 5 were in the electoral district of Macdonald.
 { 1 was " " Portage la Prairie.
 { 32 were " " Souris.

SASKATCHEWAN.

722 { 2 killed on inspection. } Valued at \$98,615.
 { 661 " at 1st test. } At a cost of \$65,743.33.
 { 54 " at 2nd test. }
 { 5 " at 3rd test. }

Two hundred and forty-two showed clinical symptoms.

Eighteen thousand three hundred and fifty-three horses were tested with mallein, of which 720 reacted and were destroyed. Of the 720 reactors, 240 showed clinical symptoms of glanders at or during the test.

Three hundred and sixty-three horses are under control for retest.

Of the 722 horses slaughtered—

722 { 63 were in the electoral district of Regina.
 { 47 " " Humboldt.
 { 3 " " Qu'Appelle.
 { 8 " " Mackenzie.
 { 77 " " Saskatoon.
 { 170 " " Battleford.
 { 44 " " Assiniboia.
 { 282 " " Moosejaw.
 { 22 " " Prince Albert.
 { 6 " " Saltecoats.

ALBERTA.

50 { 40 killed at 1st test. } Valued at \$6,950.
 { 9 " at 2nd test. } At a cost of \$4,633.31.
 { 1 " at 5th test. }

Seventeen showed clinical symptoms.

Three thousand nine hundred and forty-three horses were tested with mallein, of which 50 reacted and were destroyed. Of the 50 reactors, 17 showed clinical symptoms of glanders at or during the test.

Seven horses are under control for retest.

Of the 50 horses slaughtered—

50 { 12 were in the electoral district of Red Deer.
 { 3 " " Strathcona.
 { 11 " " Medicine Hat.
 { 12 " " Macleod.
 { 12 " " Edmonton.

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BRITISH COLUMBIA.

6 { 1 killed on inspection. } Valued at \$810.
 { 5 " at 1st test. } At a cost of \$540.

Three showed clinical symptoms.

Two thousand one hundred and eighty-three horses were tested with mallein, of which 5 reacted and were destroyed. Of the 5 reactors, 2 showed clinical symptoms of glanders at or during the test.

Fifty-four are under control for retest.

Of the 6 horses slaughtered—

6 { 1 was in the electoral district of Kootenay.
 { 4 were " " Victoria.
 { 1 was " " Nanaimo.

UNORGANIZED TERRITORIES.

7 { 6 killed at 1st test. } Valued at \$825.
 { 1 " at 2nd test. } At a cost of \$550.

Thirty-three horses were tested with mallein, of which 7 reacted and were destroyed. Of the 7 reactors, one showed clinical symptoms of glanders at or during the test. All the horses were slaughtered at Le Pas, N.W.T.

MALADIE DU COÏT OR DOURINE.

Maladie du Coït or Dourine still continues to exist to a limited extent in Southern Alberta where its presence was first detected in 1904.

As will be seen from the statistics the number of animals destroyed during the period covered by this report as being affected with the disease, is very considerably less than in any previous year since it made its appearance in Canada. It should be noted also that in the case of five (5) of the twelve (12) horses destroyed this year, the infection was derived from a stallion imported direct from the State of Iowa to South Eastern Saskatchewan. In the western part of the last named province, close to the boundary of Alberta, several animals suspected of being affected, are at present held under quarantine, but in this case it is probable that the disease, if it is found to exist, has been introduced from the old infected area which had Lethbridge as its centre.

The valuable research and experimental work which has for a number of years been carried on by Dr. Watson, the Pathologist in charge of the Branch Laboratory near Lethbridge, has brought to light many important facts, both practical and scientific, relative to the disease as it exists in America. Dr. Watson has during the past year had the advantage of spending several months in studying *Maladie du Coït* under the direction of some of the most noted pathologists of Europe and there is every reason to hope that with the additional knowledge thus acquired, it will, in the comparatively near future, be possible to completely eradicate this loathsome and insidious malady.

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COMPARATIVE STATEMENT Regarding Maladie du Coït since its detection in Canada in 1904.

Year.	Number of horses destroyed.	Value.		Compensation paid.	
		\$	cts.	\$	cts.
1904-05.....	292	24,045	00	16,029	94
1905-06 (5 months).....	120	10,210	00	6,806	48
1906-07.....	167	15,505	00	10,336	44
1907-08.....	49	5,175	00	3,449	92
1908-09.....	28	3,760	00	2,506	54
1909-10.....	37	5,130	00	3,419	98
1910-11.....	40	4,960	00	3,306	60
1911-12.....	18	2,610	00	1,739	99

Eighteen animals valued at \$2,610 were slaughtered as being affected with this disease at a cost of \$1,739.99, distributed as follows:—

District.	Suspected and Quarantined.	Slaughtered.
Manitoba—		
Souris.....	3	.....
Saskatchewan—		
Battleford.....	84	.....
Qu'Appelle.....	32	5
Regina.....	21	.....
Alberta—		
Calgary.....	18	.....
Macleod.....	83	10
Medicine Hat.....	5	3
Red Deer.....	6	.....
	252	18

Value, \$2,610. Compensation, \$1,739.99.

MANGE IN CATTLE.

Isolated outbreaks of mange continue to occur in the area in Southern Alberta and Southwestern Saskatchewan which has for a number of years been quarantined on account of the existence of this disease. The areas in which the disease actually exists are, however, being constantly reduced in size, while the number of animals affected shows a gratifying diminution. In view of the difficulties encountered in dealing with the disease among animals kept under range conditions, the progress made may be regarded as reasonably satisfactory, although even better results might be secured were it possible to obtain, to a greater extent than at present, the co-operation and assistance of the stock-owning public.

The latest reports indicate that the outbreak of mange which recently occurred in the vicinity of Kamloops, B.C., and which was directly traceable to infection introduced from Alberta, is well under control and not likely to prove serious, although there also the attitude of many stock owners leaves much to be desired.

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CATTLE MANGE.

Province.	Outbreaks.	Animals affected.	Animals quarantined.
Nova Scotia.....	10	30	93
Ontario.....	1	.....	65
Saskatchewan.....	79	297	16,608
Alberta.....	441	3,301	116,690
British Columbia.....	32	155	3,294
	583	3,783	136,750

46,576 cattle were inspected on being presented for shipment from the quarantined areas in Saskatchewan, Alberta, and British Columbia.

99,698 cattle were inspected in Winnipeg on arrival from points west thereof.

HORSE MANGE.

Province.	Outbreaks.	Animals affected.	Animals quarantined.
Quebec.....	32	46	98
Ontario.....	1	.....	1
Manitoba.....	17	40	76
Saskatchewan.....	68	92	431
Alberta.....	36	78	477
	154	256	1,083

12,123 horses and 78 mules were inspected on being presented for shipment from the quarantined area in Alberta and Saskatchewan.

ANTHRAX.

The history of Anthrax during the year just past is such as to lend additional force to the opinions expressed in previous reports as to the good effects which appear to be following the policy of preventive inoculation with Anthrax Vaccine.

The disease, however, made its appearance among sheep in the vicinity of Lethbridge, Alberta, during the year, a fact which indicates the necessity for careful supervision of the flocks and herds in that vicinity.

The following outbreaks were reported and dealt with during the year:—

Province.	Outbreaks.	Animals quarantined.
Quebec.....	11	275
Ontario.....	3	46
Saskatchewan.....	4	426
	18	748

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In Quebec, 1 outbreak was in the Jacques Cartier district, 1 in the Sherbrooke district and 9 in the Richmond and Wolfe district.

In Ontario, outbreaks were dealt with in the districts of Perth, Glengarry and Bruce respectively.

In Saskatchewan, 3 outbreaks were in the Assiniboia district and 1 in the Moose-jaw district.

One thousand three hundred and fifty six doses of Anthrax vaccine were sent out by the Biological Laboratory of the Branch.

BLACK QUARTER.

Outbreaks of this disease, which was for many years erroneously believed to be a form of Anthrax, are not dealt with under the Animal Contagious Diseases Act. The practice of preventive inoculation with the black quarter vaccine manufactured in the Biological Laboratory of this Branch, is now very generally followed by stock owners, this vaccine being in constantly increasing demand in the districts where the disease is known to exist.

Nine thousand five hundred and ten doses of Black Quarter vaccine were supplied to owners from the Biological Laboratory during the past year.

SHEEP SCAB.

As will be seen from the statistics, this disease has been practically eliminated from those portions of the Dominion in which outbreaks have been detected during recent years. A few cases were dealt with during the past season in the province of Quebec, but were of an exceedingly mild variety yielding readily to treatment. Canada is, to all appearances entirely free from the infection of Sheep Scab, but in view of the large importations of sheep now constantly being made, and the ease with which, as is shown by our past experience, it can be reintroduced from the United States, it is advisable to take every possible precaution against such a contingency. With this end in view the existing regulations have been strengthened both by careful revision and by the passing of a special Ministerial Order, copies of which, with the amended regulations are published as an appendix hereto.

In Quebec 41 animals on two premises were found to be affected with sheep scab, involving the quarantine of 286 sheep on 20 premises, distributed as follows:—

District.	Affected.	Quarantined.
Maskinonge.....	40	227
Yamaska.....	1	59
	41	286

In Manitoba 215 sheep on 1 premises were quarantined, as suspected of being affected with sheep scab. These were subsequently found to be healthy and were released.

In accordance with the Quarantine Regulations 12,593 sheep imported into Canada were quarantined for the prescribed period of thirty days

RABIES.

A number of outbreaks of Rabies have taken place in various centres within the area in Western Ontario formerly quarantined on account of this disease. All

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cases reported have been promptly and effectively dealt with by the officers of the Branch, who acting under instructions have, wherever possible, endeavoured to secure the co-operation and assistance of the municipal authorities, this being as a rule, readily given.

The public are now very much better informed as to the nature of the disease than at the time when it first made its appearance in the province some five years ago. There is now, as a consequence, not only much greater caution in dealing with animals showing symptoms suggestive of Rabies, but a very general tendency to promptly report all such cases to the proper authorities and to carefully follow official orders and instructions.

One gratifying result of the recent outbreaks of Rabies, is the marked diminution of the number of useless curs which formerly infested the towns and villages of Western Ontario, although there is still room for considerable further improvement in this regard.

One hundred and twenty-three premises were quarantined on account of the prevalence of Rabies in the adjacent districts, distributed as follows:—

ONTARIO.

District.	Premises Quarantined.
Brantford.. . . .	8
Dufferin.. . . .	8
Elgin.. . . .	6
Halton.. . . .	3
Huron.. . . .	1
Lambton.. . . .	4
Middlesex.. . . .	2
Oxford.. . . .	2
Peel.. . . .	2
Simcoe.. . . .	16
Toronto.. . . .	28
Waterloo.. . . .	3
Welland.. . . .	1
Wellington.. . . .	9
York.. . . .	30

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EPIZOOTIC ABORTION.

Outbreaks of Epizootic Abortion have, during recent years, been reported to the Department with constantly increasing frequency. The natural deduction from this state of affairs, namely that the disease is becoming more prevalent, is however, scarcely warranted by the facts. From the time when herds of any size began to be maintained in Canada, Epizootic Abortion has been responsible for very serious losses, especially to owners of cattle. Owing however, to the fact that in herds in which changes are comparatively few and infrequent, the disease has a tendency to disappear in the second or third year as the result of acquired immunity, owners have until lately been inclined to regard it either as a mysterious visitation of Providence, against which ordinary safeguards were useless, or as a malady which would yield easily to almost any kind of empirical treatment.

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It was not until the researches of Bang and Nocard, in the closing years of the last century, brought to light the fact that Epizootic Abortion was caused by a specific germ, that the public became alive to the possibility of combatting its ravages by modern scientific methods.

The subject was widely discussed from the new point of view and much attention was given to it by agricultural and professional publications. Under these circumstances it was but a short time until the more intelligent stock owners began to inquire as to the possibility of bringing the disease under legislative control, with the view of preventing the spread of infection and the introduction of affected animals to sound herds. Owing, however, to its highly insidious character, the consequent difficulty of diagnosis and the unquestionable fact that although our knowledge of the disease was greatly in advance of what it had previously been, it was still, on many important points lamentably defective, the obstacles in the way of formulating an intelligent policy for its control were almost everywhere considered too serious to warrant governmental action.

Full credit should be accorded to the many veterinary scientists who, in various countries, have devoted their time and attention to the further study of this disease. It is however, I think, beyond question that the best results have been attained from the work of Mr. Stewart Stockman, F.R.C.V.S., Principal Veterinary Surgeon to the Board of Agriculture of Great Britain, who acting under the authority of a special committee appointed in 1905, has since that time been engaged in an exhaustive study of the whole question. His first report on the subject, published in 1909, is of so interesting and valuable a nature, that I have deemed it advisable to reprint it as an appendix hereto.

I have also, as you are aware, recommended that Dr. Fred. Torrance of Winnipeg, whose scientific as well as practical qualifications render him eminently well fitted for the task, should be delegated to proceed to England for the purpose of making, at first hand, a full and searching inquiry as to the methods adopted by Mr. Stockman, and the results so far obtained.

I am satisfied that, if you see fit to adopt this suggestion, the report which Dr. Torrance should be able to furnish, will be invaluable to you in formulating an effective policy for the control of this troublesome and wasteful epizootic disease.

RED WATER.

The investigation into the nature and cause of the disease known as 'Red Water,' which for many years back has occasioned more or less loss to cattle owners in certain districts in British Columbia, is still in progress. This work is in charge of Dr. Seymour Hadwen, who has enjoyed exceptional opportunities for familiarizing himself with the subject, and who has, for some years, been making a careful study of the disease in the different districts in which it exists. His report is printed as an appendix hereto. He has now been stationed at Agassiz, B.C., in charge of a Branch Laboratory specially equipped for the carrying on of such research and experimental work as is likely to assist in the elucidation of the information still required to enable the Department to formulate a definite policy for the eradication of the disease.

BIOLOGICAL LABORATORY.

The work carried on at the Biological Laboratory at Ottawa which is under the personal supervision of Dr. C. H. Higgins, Pathologist of the Branch, is of necessity somewhat different in character from that at the Branch Laboratories at Lethbridge, Alta., and Agassiz, B.C. The latter consists almost entirely of scientific research and experimental investigation, while that at Ottawa, comprising as it does the manu-

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faeture of the various diagnostic and prophylactic agents now so largely used in the work of the Branch, is more a matter of routine.

The value of this work, in itself, can however, scarcely be overestimated, while the Laboratory is also of great importance as a training school for the young comparative pathologists, whose services are in constantly increasing demand.

This last mentioned phase of the work has been consistently kept in view ever since the first establishment of the Biological Laboratory shortly after my accession to office. It goes without saying that, in the solution of the pathological problems involved in the intelligent dealing with animal plagues, the services of the specially trained veterinary pathologist are every whit as essential as are those of the human pathologist in his own special line. It is the universal experience of the practical sanitarian whether medical or veterinary, that he can hope to collaborate successfully only with the pathologist whose attention and energies have been devoted to the special study of the diseases with which he, himself, is called upon to deal.

QUARANTINE STATIONS.

The erection of new buildings at Vancouver, White Rock and Keremeos, B.C., has been arranged for, while some slight alteration and additions have also been made to the facilities existing at the port of St. John, N.B. Beyond the necessary repairs to existing stations and the leasing of sites at several points, with a view to future construction, no additions have been made to the quarantine stations listed in my last report.

It is a matter of great regret to me that although I have for many years consistently recommended the making of such arrangements as would place the large and important quarantine station at Pt. Lévis, Que., on a sound and effective footing, no definite action has, as yet, been taken in this regard.

IMPORT TESTING.

15,005 horses were tested on arrival from the United States and allowed to proceed to their destinations.

Entered at.	Number.
Charlottetown, P.E.I.	2
Halifax, N.S.	10
Yarmouth.	9
Digby.	2
St. John, N.B.	2
Woodstock.	5
Florenceville.	15
Debec Junction.	5
Grand Falls.	14
Aroostook Junction.	46
St. Stephen.	15
McAdam Junction.	22
St. Leonards.	8
Edmunston.	5
Sherbrooke, Que.	23
St. Armand.	19

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Entered at	Number.
Athelstan..	22
Beebe Junction..	19
Beauceville..	37
Abercorn..	14
St. Johns..	8
Lacolle Junction..	21
Highwater..	19
Comins Mills..	6
Megantic..	17
Coaticook..	8
Noyan Junction..	13
Montreal..	3
Dundee..	1
Prescott, Ont..	40
Bridgeburg..	122
Sarnia..	44
Morrisburg..	6
Windsor..	223
Sault Ste. Marie..	29
Rainy River..	26
Fort Frances..	343
Toronto..	15
Cornwall..	10
Niagara Falls..	54
Kingston..	11
Cobourg..	2
Brockville..	4
Lacolle..	2
Port Arthur..	1
Emerson, Man..	3,264
Snowflake..	166
Gretna..	733
Bannerman..	180
Big Muddy, Sask..	267
Marienthal..	649
North Portal..	2,701
Willow Creek..	870
Wood Mountain..	776
Regina..	2
Coutts, Alberta..	1,008
Pendant d'Oreille..	109
Twin Lakes..	709
Frank..	4
Myncaster, B.C..	26
Bridesville..	85
Gateway..	157
Osoyoos..	259
Vancouver..	68
Victoria..	118
Grand Forks..	128
Midway..	111
Keremeos..	117

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Entered at	Number.
New Westminster	3
Rykerts	86
Nelson	64
White Rock	190
Huntingdon	230
Kingsgate	557
Rossland	46

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IMPORT Inspections from United States and Newfoundland.

Port.	Horses.	Mules.	Cattle.	Sheep.	Swine	Goats.	Rein-deer.	Asses.	Cam-els.
Charlottetown	2								
Halifax	14	1							
Sydney	76								
Yarmouth	16		1						
St. John	14								
St. Stephen	43	1							
McAdam Junction	28		24	1					
Debec Junction	5								
Woodstock	11		3						
Florenceville	15								
Arrostock Junction	64	2	32						
Grand Falls	14		4						
St. Leonards	8								
Edmundston	5		1						
Quebec							46		
Comins Mills	9		1						
Lake Megantic	17								
Coaticook	8		1						
Beebe Junction	49			3					
Sherbrooke	66		3	4					
Highwater	100	1	15						
Abercorn	18		1						
St. Armand	526	5	9			2			
Laclolle Junction	237	3	17			1			
Noyan Junction	64	1	4			1			
St. Johns	2	1			1				
Montreal								2	
Athelstan	91		23						
Dundee	29		119						
St. Agnes de Dundee	4		4						
Beauceville	37								
Quebec General	1								
Cornwall	22		1						
Prescott	222		24	3					
Morrisburg	11		2						
Brockville	8		16						
Kingston	23		2						
Cobourg	8	1							
Toronto	66								
a Niagara Falls	885	22	134	32	1	6			23
Bridgeburg	797	7	75	13,470	9				
Windsor	550	8	88	26	16	3			
b Sarnia	191	2	67	8,550	2				
Sault Ste. Marie	70		6			3			
Port Arthur	91	41							
Rainy River	26		10						
Fort Frances	673	71	20	4		1			
Ontario General	52								
Emerson	11,626	1,371	1,960	15,271	57	4		1	
Gretna	2,160	436	425	228	1				
Snowflake	178	8	61						
Bannerman	499	11	104	1	1	1			
Manitoba General			2						
North Portal	13,976	1,166	5,377	231	17	8		6	
Marienthal	846	21	250	1					
Wood Mountain	1,118	24	2	21,444		8			
Big Muddy	880	12	59	1					
Willow Creek	1,344	64	26	12,700				1	
Pendant D'Oreille	497	1	5	12,174					
Coutts	2,981	118	40	32,870	7	48			
Twin Lakes	1,249	2		810					
Alberta General	44	2	3						
	42,666	3,403	9,920	117,826	112	86	46	10	23

c—3 yak. o—3 elk.

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IMPORT Inspections from United States and Newfoundland.

Port.	Horses.	Mules.	Cattle.	Sheep.	Swine	Goats	Rein- deer.	Asses.	Camels.
a Gateway	250	26	9						
b Kingsgate	2,754	96	166	8					
Nelson	106	1	21	1,144					
Rykerts	92	2	5						
Rosland	49		251	904					
Grand Forks	125	2	45	1		1			
Midway	111	2	20						
Myncester	21	7	10	630					
Bridesville	85		43						
Keremeos	145	4	4	147		50			
Osoyoos	305	9	23	903					
Huntingdon	772	15	89	4,420	14	529			
New Westminster	3			1,794					
White Rock	820	102	32	27,892	3	512		1	
Vancouver	837	45	2	32,250	1	2			
Victoria	810	13	2	4,692					
B. C. General	456	3	10						
White Horse	120	17	492						
Total	50,527	3,747	10,244	192,611	130	1,180	46	11	23

3 yak, 10 elk, 22 buffaloes.

a 15 Buffaloes. b 7 Buffaloes, 7 elk.

IMPORT Inspections from Europe.

Port.	Horses.	Cattle.	Sheep.	Ass.	Deer.
Halifax, N.S.	14				
St. John, N.B.	579	98	2		
Quebec, Que.	27	144	371		
Sherbrooke, Que.	13				
Montreal, Que.	1,728			1	1
Bridgeburg, Ont.	31	113			
Total	2,392	355	373	1	1

PURE BRED Imports for the year ending March 31, 1912.

SHEEP.

Breed.	Great Britain.	United States.	Total.
Leicester	13		13
Shropshire	85	6	91
Hampshire	201	1	202
Oxford	48		48
Shetland	2		2
Southdown	11		11
Dorset	13		13
	373	7	380

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GOATS FROM THE UNITED STATES.

Angora..... 4

SWINE FROM THE UNITED STATES.

Hampshire... 1
 Yorkshire... 3
 Chester White... 11
 Berkshire... 8
 Duroc Jersey... 14
 Poland China... 11
 Total..... 48

PURE BRED Imports for the year ending March 31, 1912.

HORSES AND ASSES.

Breed	Great Britain.	United States.	Elsewhere.	Total.
Standardbred.....	16	99		115
Clydesdale.....	1,455	26		1,481
Shire.....	127	6		133
Hackney.....	62	1		63
Suffolk.....	45	1		46
Percheron.....	64	150	152	366
Russian.....	44			44
Belgian.....	25	14	59	98
Thoroughbred.....	4	19		23
Polo Pony.....	15			15
Pony.....	106		2	108
Shetland.....	33	1		34
Welsh Pony.....	53			53
French Coach.....		1		1
Jackass.....		1		1
Trottingbred.....		35		35
	2,049	354	213	2,616

CATTLE.

Breed.	Great Britain.	United States.	Total.
Ayrshire.....	205	1	206
Angus.....	17	2	19
Shorthorn.....	20	7	27
Jersey.....	113	65	179
Guernsey.....		2	2
Holstein.....		113	113
Hereford.....		6	6
Durham.....		8	8
Red Polled.....		45	45
	355	250	605

DISEASED IMPORTS, 1911-12.

Port.	Number of Horses in Infected Shipments.	Number of Shipments.	Number Horses Diseased.	Country of Origin.	Action.
Halifax, N.S.	1	1	1	U.S.	Destroyed.
Yarmouth	1	1	1	"	Returned.
St. Stephens, N.B.	12	1	4	"	"
Brookston Junction.	6	2	3	"	"
Cornwall, Ont.	7	2	2	"	"
Fort Frances.	8	1	3	"	"
Emerson, Man.	23	4	4	"	3 returned, 1 destroyed.
Gretna.	5	2	2	"	1 destroyed, 1 returned.
Bannerman.	17	5	7	"	Returned.
North Portal, Sask.	790	130	200	"	196 returned, 4 destroyed.
Marienthal.	24	6	9	"	Returned.
Wood Mountain.	33	6	6	"	5 returned, 1 destroyed.
Big Muddy.	33	6	9	"	9 returned; 1 suspicious destroyed.
Willow Creek.	96	6	12	"	9 returned, 3 destroyed.
Pendant d'Oreille.	4	1	1	"	Returned.
Twin Lakes.	6	1	1	"	"
Gateway, B.C.	16	2	2	"	"
Rykerts.	2	1	1	"	"
Rossland.	2	1	1	"	"
Grand Forks.	3	1	1	"	"
Midway.	6	2	2	"	"
Keremeos.	20	3	4	"	"
Osoyoos.	10	3	3	"	"
Huntingdon.	9	2	3	"	"
White Rock.	50	5	6	"	"
	1,184	195	288		

Four cows were refused admission from the United States at North Portal, Sask., and two at Nelson being affected with tuberculosis. One horse was also refused admission at North Portal, being affected with mange.

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ANIMALS Inspected for Export April 1, 1911, March 31, 1912.

	Horses.	Mules.	Cattle.	Sheep.	Swine.
St. John to Great Britain.....	23		3,375	1,798	
Charlottetown to Great Britain.....			21	76	
Quebec to Great Britain.....			588		
Montreal " ".....	118		45,037	3,484	
Toronto " ".....			9,391		
Niagara Falls to Great Britain.....			144		
Inspected at Montreal for shipment to Great Britain via Boston and Portland.....			14,110		
St. John to South Africa.....		375			5
Montreal " ".....	10	367	92	241	
Halifax to Bermuda.....	62		38	77	46
" St. Pierre and Miquelon.....			14	10	4
" Newfoundland.....	36		5	13	181
" Jamaica.....			15		
" St. Vincent.....				14	
" Demerara.....	5				
" St. Kitts.....	1				
" Monserrat.....				2	2
" Antigua.....	8				
" Barbadoes.....	21		2		
" Trinidad.....	5				
Sydney to St. Pierre and Miquelon.....	1		51	384	
" Bermuda.....	1				
Toronto to ".....			45	280	
Montreal to France.....			364		
Toronto to Antwerp.....			1,140		
" Brazil.....			60		
Charlottetown to Newfoundland.....	30		1,248	1,214	432
Summerside ".....			310	276	
Bayfield ".....	19		215	44	
Mulgrave ".....	31		643	788	
Sydney ".....	427		1,087	523	116
Montreal ".....			9	90	
Charlottetown to United States.....	1			6	
Toronto to United States.....				418	
Niagara Falls to United States.....			15		12
Bridgeburg to United States.....				319	
Total.....	799	742	78,619	10,057	798

EXPORT ANIMALS Rejected at the following ports from April 1, 1911, to March 31, 1912.

	Cattle.	Sheep.
St. John, N.B.....	5	1
Montreal, Que.....	177	5
Toronto, Ont.....	53	
	235	6

Of the above 58 cattle at Montreal, and 33 at Toronto were rejected for actinomycesis. The rest of the animals were suffering from lameness or injuries received during transportation and showed no indication of contagious or infectious disease.

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STAFF.

The following changes have taken place in the personnel and disposition of the staff during the year:—

In the Contagious Diseases Division of the Health of Animals Branch the following additions were made to the staff of Veterinary Inspectors:—

A. E. Alexander, V.S.
 J. P. Aikenhead, V.S.
 F. Braund, V.S.
 A. C. Blackwood, V.S.
 G. C. Cockerton, V.S.
 H. B. Coleburn, V.S.
 J. Dickenson, V.S.
 H. H. S. George, V.S.
 W. L. Hawke, V.S.
 O. Hall, V.S.
 R. D. MacIntosh, V.S.
 W. G. Moore, V.S.
 E. A. Meakings, V.S., (re-engaged).
 H. S. Manhard, V.S.

A number of additions to the Field Inspection Staff were also made by the transfer of Inspectors from the Meat Inspection Division.

The services of some few officers were dispensed with for various reasons, and the resignations of several others accepted, among these latter, I regret to state being Car Inspector Jas. W. Robb and Veterinary Inspector W. T. Patton.

Three new car inspectors were added to the strength, namely Mr. A. Sparrow, (who assumed the duties formerly performed by Mr. Robb), and Messrs. R. Blackwood, W. H. Shaver and C. W. Young.

Speaking generally but few changes were made in the locations of the various officers, except in such cases as this was rendered necessary by the exigencies of the service.

Some additions were made to the clerical staff during the year, and the Meat Inspection Division lost one officer by death in the person of E. E. Irvin, B.V.Sc.

In the Meat Inspection Division, several resignations were also accepted, while the following veterinary and lay inspectors were added to the staff:—

Veterinary Inspectors.	Lay Inspectors.	Canning Inspectors.
R. D. Boast, B.V.Sc. S. G. Bright, B.V.Sc. C. S. Cain, V.S. H. Colebourn, V.S. R. H. Cook, V.S. E. E. Irvin, B.V.Sc. S. Jacques, B.V.Sc. H. C. Leslie, V.S. M. H. Milton, B.V.Sc. G. H. Paquette, B.V.Sc. A. C. Tanner, B.V.Sc. R. G. Tupling, B.C.Sc. C. H. Weaver, B.V.Sc.	T. Babe, V.S. H. Beaudoin. R. Benoit. W. J. Blainey. W. A. Hilliard, V.S. Win. Howard. E. Hunter. P. J. Kelly. Paul Kingston. R. H. Lyon. D. McDonald. D. Rivet. J. R. Songhurst.	A. Bowlby. W. Graham.

In the Live Stock Branch Mr. R. S. Hamer, B.S.A., was engaged in November last to act as assistant to the Assistant Live Stock Commissioner, while a poultry expert in the person of Mr. W. A. Brown, B.S.A., was added to the staff in September.

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Owing to the constantly increasing interest taken by breeders in the Canadian Record of Performance for Dairy Cattle and the consequent volume of inspection work necessary in this connection, it has been found necessary to appoint a number of new inspectors for this work during the year. Messrs. E. M. Chalcraft, W. H. Irvine, J. Sedgewick, J. M. Scott, C. S. Wood, H. J. Ingalls, and A. S. Morrison were accordingly engaged, the two last named having since resigned together with Messrs. G. W. Clemous and W. H. McNish, two of the inspectors previously engaged in this work.

Owing to the increasing pressure of official duties and the peculiar circumstances which, during the past year, have affected their performance, it has been necessary for me to remain almost constantly in Ottawa, although doing so involved absence from many important gatherings which otherwise I would have been able to attend. Among the more important of these might be mentioned the meeting of the Permanent Commission on International Veterinary Congresses, of which I am a member, and which was convened in June last at Baden-Baden. I was also unfortunately prevented by illness from attending the inaugural meeting of the Canadian Public Health Association, although I have since been appointed the Convenor of the Animal Foods Section of that organization.

In my capacity as Chairman of the International Commission on the Control of Bovine Tuberculosis, I attended a meeting of that body held in August last at Toronto during the Convention of the American Veterinary Medical Association.

In January last the business relations between the drovers and commission men doing business in Toronto, and the packers and other buyers of cattle on the markets of that city, underwent a somewhat serious interruption. It was claimed by the packers that as a consequence of the losses due to the condemnations resulting from the enforcement of the Meat and Canned Foods Act, it was necessary for them to inaugurate a system of dockage in the case of all cattle purchased either on the Western Cattle Market or at the National Stock Yards, the scale which they desired to establish being at the rate of 20 cents per head for all animals sold at over three and one half cents per pound, and 50 cents per head for all animals sold at a less figure. To this proposition the drovers and commission men dissented so vigorously that for nearly a fortnight, business was practically at a standstill. At your request, I proceeded to Toronto, where in collaboration with Mr. W. F. MacLean, M.P., I succeeded in bringing about a compromise and restored friendly relations.

STOCK YARDS AND CARS.

I am pleased to be able to report that a marked improvement has been brought about in the various live stock markets, as well as in the railway and other stock yards, and stables used for the public accommodation of animals either in transit or offered for sale, by the comprehensive system evolved and placed in operation by this Branch, whereby this particular class of work is entrusted to a number of special inspectors whose duty it is to keep a close watch on all establishments of the kind mentioned above and to see that the provisions of the Act and the regulations are duly enforced. A similar advance has been made with reference to all cars used for the conveyance of live stock, which, by arrangement with the railway companies concerned, are thoroughly cleansed and disinfected under the supervision of special inspectors at many of the principal divisional points.

The railways though at first inclined to minimize the importance of this work, have during recent years co-operated with the Branch in a very friendly and gratifying manner, and the improved conditions are greatly appreciated by the stock owning public, especially those persons who find it necessary to ship stock by rail. Safety from disease infection is of course the principal object in view, while the additional comfort and reduced suffering of the animals are not to be disregarded.

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A set of regulations governing generally the transportation of live stock and setting forth the conditions under which shipments of this class are to be dealt with, are now under consideration by the Board of Railway Commissioners, and their promulgation, while simplifying and rendering largely more effective the work now being done by the officers of this Branch, will at the same time undoubtedly prove of great value to the live stock interests of the country.

MEAT INSPECTION.

The work in this division has, during the past year been still further organized and developed.

The number of Veterinary Inspectors now employed under the Meat and Canned Foods Act is 85, while the lay inspectors number 21.

No specially serious difficulties have, during the year, been encountered in the enforcement of the Meat and Canned Foods Act. It is a matter of regret that it has not yet been found possible to bring about the changes in policy with regard to the admission of foreign meats which have, for so long, been strongly advocated by the packers.

The vexed question of the disadvantages to which establishments operated under the Act are subjected in the matter of interprovincial trade, is still under discussion, although its adjustment on sane and reasonable lines is of infinitely more importance to the public health, than it is to the pockets of the legitimate packers who are at present the chief financial sufferers from the unfair legal discrimination which, under present conditions undoubtedly exists.

The sentiment in favour of municipal abattoirs, in which meats intended for domestic consumption would be submitted to expert examination, in the same manner as is now done, under the Meat and Canned Foods Act, in the case of those destined for export, continues to grow in strength.

It appears therefore, highly probable that this sentiment will, in the near future, have the effect of compelling our provincial and municipal authorities to provide for the establishment, under provincial legislation, of such a system of domestic meat inspection as will place the products offered by the ordinary retail butcher, on a footing equal in quality and soundness, with those emanating from the establishments operated under the provisions of the above named measure.

FRUIT, VEGETABLES AND CONDENSED MILK.

This work has progressed steadily. Through the efforts of your inspectors the sanitary conditions of the factories engaged in the packing of fruit, vegetables and milk show marked improvement.

The quality of the raw materials used with few exceptions gives little cause for complaint.

This industry is growing rapidly, many new plants are now in course of construction while numerous others are contemplated.

This will no doubt produce a keener competition and in consequence there exists the danger of the manufacture of what might properly be called a second class product.

Such a condition could be effectually met by the early adoption of satisfactory standards.

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A list of the establishments now under inspection and a statement of the results of the post mortem inspections in these establishments from April 1, 1911 to March 31, 1912 is given below:—

ESTABLISHMENTS under Inspection, March 31, 1912.

No.	Name.	Place.	Inspectors.
1	Fowler's Canadian Co.	Hamilton	C. J. Johannes, V.S. W. A. Morrin, V.S. J. E. A. Duhamel, M.V. J. Edgecombe.
2A	Mathews-Laing, Ltd.	Hull, P.Q.	W. H. Marriott, V.S. (pro tem). J. F. Campeau, M.V. A. C. Tanner, B.V.Sc. J. Terrance.
2B	Mathews-Laing, Ltd.	Brantford	W. Kime, V.S. J. T. Davidson, V.S.
2C	Mathews-Laing, Ltd.	Peterborough.	W. A. Henderson, V.S. J. O. Guertin, M.V.
2D	Laing Packing & Provision Co ...	Montreal.	F. H. S. Lowery, V.S. R. D. Boast, B.V.Sc. E. Dufresne, M.V. J. R. Young. D. McDonald.
25	West End Abattoir.	Pointe St. Charles	W. H. James, V.S. J. N. L. Couture, M.V. S. G. Bright, B.V.Sc. L. J. Demers, M.D., M.V. C. E. Deronie, M.V.
4B	Wm. Davies Co., Ltd.	Montreal.	J. W. Symes, D.V.S. F. A. Walsh, V.S. C. H. Weaver, B.V.Sc. H. Macey.
22	Montreal Union Abattoir.	Montreal.	E. G. Lemieux, M.V. N. W. Reid, M.V. M. H. Milton, B.V.Sc. C. D. Bancroft, D.V.S. S. Jaques, V.S. H. Beaudoin.
24	Wm. Clark.	Montreal.	A. R. Douglas, D.V.S. E. Lallemand.
29	N. K. Fairbank Co.	Montreal.	H. Mizener.
3	Montreal Packing Co.	Pointe St. Charles	R. Benoit.
4A	Wm. Davies Co., Ltd.	Toronto.	D. C. Tennant, V.S. W. Moynihan, V.S. R. D. Orr, V.S. A. A. Belanger, M.V. W. J. Blainey. P. J. Kelly. W. Howard.
2E	Mathews-Laing, Limited.	Toronto.	A. R. Torrie, V.S. T. W. R. MacFarlane. D. A. Irvine, V.S. E. Cox.
7	Harris Abattoir Co.	Toronto.	A. C. Walker, V.S. J. W. Purdy, V.S. D. Brown. (T. Babe, V.S.)

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ESTABLISHMENTS under Inspection, March 31, 1912—*Continued.*

No.	Name.	Place.	Inspectors.
28	W. Wight & Co.....	Toronto.....	W. Lawson, V.S. (M. W. Everett.)
18C	Swift Canadian Co.....	West Toronto.	D. R. Bone, V.S. R. H. Cook, V.S. F. A. McNally, V.S. C. S. Cain, V.S. J. A. Hodgins. E. Hunter. P. Kingston. J. Langevin, M.V.
9	Gunns Limited	West Toronto.	J. H. George, V.S. J. E. Morse, V.S. H. C. Leslie, V.S. C. Brittain. J. R. Songhurst.
10	F. W. Fearman, Ltd.....	Hamilton	A. C. Ramsay, V.S. W. J. Moon, V.S. H. Garrett, B.V.Sc.
11	Ingersoll Packing Co.....	Ingersoll.	E. R. Farewell, V.S. G. C. Brownridge, V.S.
13	Whyte Packing Co..	Stratford	C. E. Edgett, V.S. A. W. Beach, V.S.
14	Collingwood Packing Co	Collingwood.....	W. R. Bell, V.S. A. R. Monroe, B.V.Sc.
17	Jones Packing & Provision Co.....	Smiths Falls.....	J. B. White, V.S.
31	O'Keefe & Drew Abattoir Co . . .	Chatham.....	J. R. Thompson, V.S. W. R. Monroe, V.S.
27	Tillsonburg Packing Co.....	Tillsonburg.	T. M. Pine, V.S.
18	Swift Canadian Co., Ltd.....	Winnipeg	A. R. Walsh, V.S. J. R. N. Harrison, V.S. H. J. Elliott, M.D.V. W. A. Hilliard, V.S.
19	Gordon, Ironside & Fares.....	Winnipeg	J. D. Ross, V.S. J. H. Shonyo, V.S. H. Colebourn, V.S. R. H. Lyon.
20	Gallagher, Holman & Lafrance . . .	Winnipeg.	T. H. Richards, V.S. A. Hobbs, V.S. G. Tupling, B.V.Sc.
21	Western Packing Co.	Winnipeg.....	F. C. Jones, V.S. R. B. Dellert, B.V.Sc.
23	P. Burns & Co., Ltd	Calgary	E. A. Bruce, V.S. I. Christian, V.S. T. G. McClelland.
18B	Swift Canadian Co.....	Edmonton.....	J. R. English, V.S. C. W. J. Haworth, V.S. E. C. Bishop, V.S.
33	Dominion Meat Co.....	Calgary	C. Maconachie, V.S.
50	Davis & Fraser.....	Charlottetown.....	A. C. Lundy, V.S.

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ESTABLISHMENTS under Inspection. March 31, 1912—*Concluded.**Under Temporary Inspection.*

No.	Name.	Place.	Inspectors.
44	Lambton Packing Co.....	Petrolia.....	F. L. Wingate, V.S.
31	Delhi Canning Co.....	Delhi.....	C. L. Wallace, V.S.
	Chief, Meat Inspection Division...		R. Barnes, V.S.
	Canning Inspectors.....		C. S. McGillivray. W. A. D. Graham. A. Bowlby.
	Travelling Inspector.....		H. H. Ross, V.S.
	In charge of Toronto.....		L. A. Willson, V.S.
	" Montreal.....		M. J. Kellam, V.S.
	" Winnipeg.....		C. D. McGilvray, M.D.V.
	" Prince Edward Island.....		W. H. Pethick, V.S.

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DISEASES found at Establishments under Inspection.

Disease.	CATTLE.			SHEEP.			SWINE.			Poultry.
	Car-cases.	Por-tions.	Lbs.	Car-cases.	Por-tions.	Lbs.	Car-cases.	Por-tions.	Lbs.	
										Lbs.
Abscess.....	13	20,487		10	94		11	1,443		
Actinomycosis.....	9	6,364						487		
Adhesions.....		1,306			71			2,204		
Albuminous degenera-tion.....		362			90					
Atrophy.....		15								
Bruises.....	95	9,910	230	28	620	6	27	3,685	11,322	
Cripples.....		110			22		1	5,508		
Cysts.....		49						41		
Cysticercus Bovis.....	127	31								
Cysticercus cellulosae.....							121	31		
Cysticercus tenuicollis.....				2	4			11		
Congestion.....		30						310		
Cirrhosis.....		7						13		
Decomposed.....									278	
Dirty.....		24	624		4			2	334	
Emaciation.....	49			73			21			
Enteritis.....	7			2	2		22			
Empysema.....								546		
Hernia.....	1	1			1		1	41		
Hydræmia.....	79									
Hydremic cachexia.....				28				16		
Hypertrophy.....		7								
Hog Cholera.....							37			
Immaturity.....	722									
Improper bleeding.....	9			8			42			
Inflammation.....							5			
Icterus.....				1						
Jaundice.....	3			5	2		14	10		
Metritis.....	13			2			6			
Mucoid degeneration.....	30									
Mau. mitis.....		27						10		
Melanosis.....	2	5								
Necrosis.....	1	340		1	1,051			5,544		
Nephritis.....	14			4			7			
Parturition.....	3									
Parasites.....		8,349		1	24,236			23,568		
Pericarditis.....	36			2			9			
Peritonitis.....	21			4			51			
Pleuritis.....	7			4			30			
Pneumonia.....	55			22			98			
Pyæmia or septicaemia.....	96			42			207			
Sexual Smell.....	1						76			
Skin diseases.....							1	61		
Sarcoma.....	3						4			
Sour.....	5		502,148			9,055	2		208,377	12,702
Septic infection.....	4	1								
Tuberculosis.....	1,649	16,836					2,020	411,484		
Tumours.....	6	230		1	2		5	12		
Uremia.....	1									
Various.....	11	86		1	3		20	353		
Total.....	3,072	64,577	503,002	241	26,202	9,061	2,838	455,380	220,331	12,702 and
Found dead.....	107			143			1,680			672 car.

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The following summary shows the results of post mortem inspections of cattle, sheep and swine from April 1, 1911 to March 31, 1912:—

Cattle marked 'Canada Approved'.. . . .	405,329
Carcases of cattle 'condemned'.. . . .	3,072
Percentage of cattle 'condemned'.. . . .	.15—1
Portions of cattle 'condemned'.. . . .	64,577
Sheep marked 'Canada Approved'.. . . .	376,196
Carcases of sheep 'condemned'.. . . .	241
Percentage of sheep 'condemned'.. . . .	.06
Portions of sheep 'condemned'.. . . .	26,202
Swine marked 'Canada Approved'.. . . .	1,850,159
Carcases of swine 'condemned'.. . . .	2,838
Percentage of swine 'condemned'.. . . .	.15
Portions of swine 'condemned'.. . . .	455,380
Total number of carcases 'passed'.. . . .	2,631,684
Total number of carcases 'condemned'.. . . .	6,151
Percentage of carcases 'condemned'.. . . .	.23
Total number of portions 'condemned'.. . . .	546,159

During the course of re-inspection, the following meats were condemned:—

—	Cattle.	Sheep.	Swine.	Poultry.
Sour.....	502,148	9,055	208,377	12,702
Dirty.....	624		354	
Bruised.....	230	6	11,322	
Decomposed.....			278	
Total.....	503,002	9,061	220,331	12,702

Total amount on re-inspection = 745,096 lbs.

LIVE STOCK BRANCH.

In my last annual report I dwelt at considerable length on the serious and disquieting fact that live stock production is not keeping pace with the gratifying progress made by the country in almost every other respect.

Commenting on the statistics for 1910-11 which were very discouraging, although, I regret to say, less so than are the corresponding figures for the year just past, I took occasion to emphasize the statement often previously enunciated, that inasmuch as agriculture, which is and must always be, the mainstay of Canada, cannot possibly enjoy permanent prosperity unless the live stock industry, the sheet anchor of the successful husbandman, is in a flourishing condition, there should be no cessation of intelligent effort and no grudging of reasonable expenditure to ensure the proper development of that industry.

The lack of interest in live stock production evinced during recent years by many farmers, especially in the western provinces, while superficially apparently due to a number of widely varying causes, some of which are, of course, local and temporary, is, in my opinion, chiefly attributable to one condition, deeply underlying the whole regrettable situation.

With regard to those agricultural staples for which there is a remunerative home demand, and those in regard to which the export trade has been systematically

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organized and fairly conducted, the farmer generally feels that he is reasonably sure of obtaining their actual market value. On the other hand, the peculiar conditions which have hitherto governed the Canadian trade in commercial live stock, have been such as, in many instances, to leave the producer practically helpless in the hands of the dealer, who, as a rule and very naturally, when there is nothing to compel him to do otherwise, pays only the lowest possible price which he can get the farmer to accept, regardless of actual market value.

In this, as in other things, human nature has to be reckoned with, and to those familiar with the conditions under which the western grain trade was carried on prior to the introduction of organization among the producers, to say nothing of other staples which, at an earlier day, were exploited in a like manner, it must be evident that the greatest need of our decadent trade in live stock is the systematic development of modern methods of marketing, preferably co-operative, but in any case, such as will ensure to the producer a fair and equitable price for that which he may have to sell.

Fluctuations in value, sometimes very considerable, must of course, occur in accordance with the law of supply and demand, but for these an effective remedy has not yet been found, although a praiseworthy effort in this direction is now being made by the various countries interested in the International Institute of Agriculture at Rome. As has been demonstrated, however, in the case of other agricultural staples, it is quite possible for growers of live stock to protect themselves, by intelligent co-operative action, against those unfair and unscrupulous buyers who, as matters now stand, are only too often able to manipulate markets and prices to their own temporary advantage.

Briefly therefore, it would appear that the most important phase of the task confronting those desirous of permanently increasing live stock production in Canada, is that of providing a sound and reliable market, capable of absorbing the total output, no matter how great it may eventually become.

With the home market established on a sound and equitable basis and the profitable disposal of any possible surplus provided for through carefully conducted and controlled export channels, it is practically certain that live stock production would very shortly regain its normal proportions.

It would, of course, be impossible, even under the most favourable circumstances, to guarantee continuous high prices, but so long as the figures obtainable were fair and just and as high as might reasonably be looked for in the face of honest competition, our farmers would in this as in other matters, be found willing to accept the situation.

The need for intelligent action along the lines above indicated is in no wise lessened by the fact, now daily becoming more evident, that the country is already on the eve of a revival in the live stock industry.

The high prices now prevailing as a result of the continued shortage and the increased consumption of meat and meat food products, due to the present era of development and prosperity, are already beginning to exercise a marked influence on the market for breeding stock. This may be safely taken as an indication that during the next few years there will be a distinct advance in live stock production.

Unless, however, proper provision is made for the legitimate and profitable disposal of the animals when produced, the old story will be repeated and low prices will again drive the discouraged stock-grower from the field.

The present time would, therefore, appear to be admirably suited for the inauguration of a sound and sane market policy, and I have no hesitation in submitting for your consideration the suggestion that this phase of the question should be accorded your most careful consideration, as well as that of the officers of this branch of your department.

In this connection much useful ground has already been broken through the comprehensive investigation of the market conditions affecting mutton and wool,

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which, during the past two years has been conducted by this branch of your department through the agency of Messrs. Dryden and Ritch, acting under the direction of the Live Stock Commissioner.

The report of these gentlemen, issued in January last, is in itself so full and complete that any further reference to or review of its contents would appear to be superfluous.

The marked interest aroused through the Dominion by its wide distribution has been sustained by the series of meetings now being held under the auspices of this branch, acting in collaboration with the different provincial departments of agriculture.

The generous grant to the Dominion Sheep Breeders' Association which you have recently authorized, will enable that body to undertake many useful activities, not the least among which should be the upbuilding, on the foundation already laid by this branch, of that profitable and permanent interprovincial trade in pure-bred sheep, which more than any other possible factor, is calculated to bring about the much needed revival of the commercial side of the industry.

I desire respectfully to congratulate you on your readiness to approve and extend the policy of aid to Thoroughbred stallions, which was adopted only during the last fiscal year, although for a long time urged upon the department by those interested in the improvement of the light horse stock of the Dominion, with especial view to the production of animals suitable for army purposes, which, in the event of their being required, would be of infinitely greater value to the British Government, as well as to our own, than the useless nondescripts of like size and weight, now annually produced.

With the view of giving further publicity to the conditions on which the aid in question is now given, it has been thought advisable to print, as an appendix to this report, the various forms used in that connection.

The number of cows entered for test in the Canadian Record of Performance has largely increased during the past year, a total of 801 being entered at the end of the fiscal year, 1911-12, as compared with the total of 586 entered during the year ending March 31, 1911. As stated elsewhere, a number of inspectors have been added to the staff for the carrying on of this work, thus affording facilities for a more efficient and satisfactory service. A new feature was introduced in January of this year when arrangements were made for reports by the several inspectors as to the quantity of fodder fed to the different cows under test, the approximate cost of the milk being produced and the nutritive composition of the ration. From the interest which has developed in this new phase of the work, it should ultimately prove an important adjunct to the Canadian Record of Performance.

You were good enough to approve of the calling under the auspices of your department of a convention of the Canadian National Live Stock Association in Ottawa, in February of this year. At this convention a number of important subjects relative to and affecting live stock were discussed. The report of this gathering, in which will be found embodied the comprehensive resolutions defining the views of the members of the association, will be found published as an appendix hereto.

A special officer has been engaged for some months in making a study of the methods followed in the production and marketing of eggs and poultry in Ontario and Quebec, and the manner in which poultry products are handled from producer to consumer. Much valuable information has already been secured and the foundation laid for definite constructive work in the interests of the industry.

As it was thought that full advantage might not have been taken by the breeders of French Canadian horses in some districts in the province of Quebec, of the opportunities afforded them of having their animals examined at the time of previous inspections, a further re-inspection of French Canadian stallions and mares for registration as foundation stock has been arranged for and is now in progress. It is expected that this work will be finally concluded during the coming summer.

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Assistance has been continued to the various provincial organizations in the interests of the live stock industry, and the furnishing of expert live stock judges and lecturers in response to requests from the various provinces has, during the past year, constituted an important feature of the work of the Branch. The services of these lecturers and judges are in constant demand, the advantages accruing from this interchange of opinion and thought by the live stock men of the various provinces being now generally recognized and the policy of your Department in this connection receiving unanimous endorsement.

Report No. 4 of the Canadian Record of Performance has been published during the past year and appears as an appendix hereto. A bulletin on 'Horse Breeding and the Rearing of Colts,' has also been published and widely distributed as has also the report of Mr. H. S. Arkell, B.S.A., Assistant Live Stock Commissioner on 'Government Assistance to Agriculture in certain countries of Europe,' both of which appear as appendices to this report. The special report of the Sheep Commissioners, Messrs. Dryden and Ritch has been published in attractive form and as stated previously in this report, is so full and comprehensive that further reference to its contents is unnecessary, in view of the fact that it has been very widely distributed. The steady demand for the publications issued by the Branch is an evident indication that they are appreciated by farmers and stock men generally.

I have the honour to be, sir,

Your obedient servant,

J. G. RUTHERFORD,

Veterinary Director General and Live Stock Commissioner.

Honourable MARTIN BURRELL.

Minister of Agriculture,
Ottawa, Ont.

APPENDIX No. 1

G. HILTON, V.S., Chief Veterinary Inspector,

OTTAWA, March 31, 1912.

SIR,—I beg to submit herewith my report for fiscal year ending March 31, 1912.

At the commencement of this period I visited the Niagara Peninsula accompanied by Inspector Stork, of Toronto, for the purpose of interviewing the reeves of several municipalities regarding the advisability of enforcing muzzling orders in their respective districts. The rabies situation was thoroughly discussed, your policy in dealing with outbreaks of this disease explained, and the responsibility resting upon municipal authorities in this connection distinctly outlined. Some of the municipalities promptly enforced suitable restrictions, others did so at first reluctantly, but eventually assisted very materially in controlling the outbreak.

On April 20, assisted by Inspector Tennent, I took charge of the annual examinations of this Branch for Veterinary Surgeons at London, Ont., and the following day visited Windsor, where, accompanied by Inspector Jones, I discussed with the railway representatives matters in connection with the satisfactory equipment of transit hog cars. The object of the special requirements of Ministerial Order 33 was fully explained and a distinct understanding arrived at with the representatives in question. A ruling in this connection was then given to the inspectors concerned, in order that their decisions might be uniform in accepting or refusing the entry of such cars.

While at Windsor I investigated, with Inspector Jones, a small suspected outbreak of hog cholera, and upon confirming this disease wired Inspector Rowe to assist the former officer in eradicating the outbreak.

I then proceeded to Sarnia, and after interviewing Inspector Brown left for Bridgeburg, where dissatisfaction existed in some of the municipalities in this vicinity, owing to the fact that while they were enforcing muzzling orders others were not. Accompanied by Inspector Philips I again consulted several of the reeves of the districts concerned. The seriousness of the situation was thoroughly explained and the importance of effectively enforcing the muzzling orders pointed out.

While admitting the necessity of such measures and their responsibility in the case, some of the reeves did not care to take any active part in their enforcement. They finally, however, agreed to enforce suitable restrictions and were advised that if at any time they experienced difficulty in this connection prompt assistance would be given by the officers of this Branch.

I then returned to Ottawa, where I remained until the 27th of May, leaving on that date for the western provinces.

In accordance with previous arrangement, Inspector McGilvray met me at Kenora, and accompanied me as far as Winnipeg. This gave me an opportunity of discussing matters with him relative to the work of this Branch in the provinces of Manitoba and Saskatchewan.

Upon arriving at Regina on the 29th of May, I discussed matters in connection with the work in that province with Inspector Tamblyn, and in order to facilitate the work a few changes were made in the headquarters of some of the officers.

I proceeded to Medicine Hat on the 1st of June, and interviewed Inspector Hargrave regarding the work in the province of Alberta. While at this point I had the opportunity of discussing with several range riders matters in connection with their

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particular work. Some difficulty having arisen in connection with the dipping on one of the reserves, owing to the resignation of the Indian Agent, the situation was discussed with the Veterinary Officer in charge of the district and then referred to you.

On the 6th of June, I accompanied Inspector Hargrave to Lethbridge and visited the quarantine station for the purpose of supervising the mallein test of a horse, over which more or less difficulty had previously been experienced, and incidentally to talk over the work at this station with the officer in charge. While at this point I met Inspectors Busselle and Gallivan, and Car Inspector Harris, and talked over with them several matters of importance.

On our way to Coutts the following day we met Range Rider Murphy and discussed matters in connection with his official duties with him. At Coutts we interviewed Inspector Patton and inspected the quarantine stable and corrals.

We returned to Medicine Hat the same evening, where I remained for a few days, and then, accompanied by Inspector Hargrave, left for Calgary en route to Edmonton. At the former point we interviewed the inspectors stationed there, and discussed with them matters pertaining to their particular duties.

On our arrival at Edmonton on the 16th we met Car Inspector Miller and W. H. Shaver, who was later appointed to assist the former officer in his work. Mr. Shaver was thoroughly instructed in the details of his duties, and was therefore in a position to commence work immediately his appointment was confirmed. While at this point Inspector Caldwell consulted us in connection with some trouble experienced by him in dealing with glanders on an Indian reserve. The situation was thoroughly discussed, and the following day we accompanied him to the reserve in question, where we interviewed the Indian Agent and made satisfactory arrangements to overcome the difficulty.

Returning south we stopped over at Lacombe and consulted Inspectors Talbot and Harrington, and the following day Inspector Hargrave proceeded to Medicine Hat, while I went on to Kamloops. I was met at this point by Inspector Tolmie, and discussed with him and Inspector Thomson matters in connection with the conditions on the range and the enforcement of the mange regulations.

I left the following day, with the former officer, for Vancouver, arriving there on the 21st of June; we visited the office of this Branch, interviewed Inspector Ransom, and, accompanied by Car Inspector Kininmonth, inspected the car cleaning plant of the C.P.R. The system adopted here is an excellent one, the work being performed in a most satisfactory manner.

The quarantine station on Triumph St. was inspected, and the contractors for the new quarantine stable were advised relative to some minor details in the construction of the building.

I then proceeded to Victoria and remained at that point for two days. While there I visited the office rented for the use of Inspector Tolmie, and accompanied Inspector Richards to the quarantine station. The latter buildings are suitably located, well isolated and situated at a convenient distance from the wharfs. They are light, sanitary, well kept and in good repair.

Returning to Vancouver on the 23rd I met Dr. Hadwen and discussed with him matters in connection with his work. The following day I left for Nelson, with Inspector Tolmie, arriving there on the 25th. At this point, accompanied by Inspector Frank, I inspected the quarantine site and found nothing of any value remaining of the recently burned stable, although the adjoining corrals were intact and in good repair. I found the stable, which is now being rented, conveniently situated and apparently satisfactory.

Leaving this point on the morning of the 26th we arrived at Grand Forks the same day. The quarantine stable was inspected, and Inspector Paxton consulted regarding his work, after which we left for Oroville, Wash., en route to Keremeos. Inspector Coristine, in accordance with previous arrangements, came down from Osoyoos to Oroville, and discussed matters relating to his work with us.

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Arriving at Keremeos on the 27th we looked over the Great Northern Railway Yards, with Inspector Jermyn, with a view to locating a suitable site for the erection of a quarantine building, and then returned to Midway. At Midway we again met Inspector Paxton and inspected the quarantine station at this point.

We then proceeded to Nelson, and soon after our arrival Inspector Tolmie left for Vancouver, while I went to Kingsgate. Arriving there on the 30th I met Inspector Mitchell, and with him looked over the quarantine buildings, after which I left for Gateway. On my arrival at the latter point I found Inspector Foster absent on field duty. I, however, inspected the quarantine buildings and then went on to Lethbridge, arriving at the latter point on July 4.

The following day I went to Coutts and made a special investigation of certain complaints at this point, after which I returned to Medicine Hat, where I remained for a few days.

Upon receiving instructions from you, Inspector Tolmie was wired to transfer Inspector Thomson from Kamloops to Keremeos, and Inspector Morgan, who had been engaged for some time in the mange area in Saskatchewan was located as quickly as possible, and instructed to proceed to Kamloops where his services were urgently required in connection with the construction of dipping vats.

Owing to the removal of Inspector Thomson from that point Inspector Gallivan was temporarily transferred to Kamloops to take charge of dipping operations.

I visited the Cardston district accompanied by Inspector Hargrave on July 10 for the purpose of consulting an owner, who objected to having a few non-clinical reactors destroyed. These were valuable animals and as none of them exhibited any symptoms of disease, a great deal of difficulty was experienced in convincing the owner that they were actually affected.

As it was our intention to visit Lethbridge on the 11th for the purpose of witnessing a post mortem on a non-clinical reactor, the owner suggested accompanying us. This having been agreed to, we proceeded to Lethbridge on the date mentioned, and had no difficulty in demonstrating glanders lesions in the carcase of the animal in question.

Advantage was taken of this opportunity to thoroughly discuss all matters in connection with your glanders policy, and the owner was apparently convinced regarding its soundness as he consented to the destruction of the reactors in preference to holding them for retest under the forfeiture clause of the regulations.

I then proceeded to Medicine Hat, and the same evening left for Brooks. The following day I witnessed dipping operations at an excellent dipping plant on the Little Bow river. I found that the dipping mixture had been well prepared and maintained at a suitable temperature during treatment. The cattle were in good condition, but there was no difficulty in detecting mange in a number of them as they swam through the vat. With few exceptions these animals swim with their withers exposed, and pass far too quickly even through the longest vats. Although the mangy animals are cut out from the herd before treatment, and put through the vat separately, so that closer attention can be given them, a certain number escape detection until they are going through the vat with the supposedly healthy herd; special care is, therefore, required to detect these animals and impede their progress through the vat. In this connection I would say that trouble is often experienced by the officer in charge in holding them long enough in the vat to insure effective results, as many owners object to the delay which naturally occurs. Their objection is due chiefly to the impracticability of holding large herds without sufficient feed for lengthy periods, and the difficulty of keeping them from mixing, when only a part of the herd are put through the vat at one dipping. I, therefore, discussed this phase of the question thoroughly at every opportunity with the inspectors and range riders in the mange area, and pointed out to them the necessity of exercising the utmost vigilance and care in dipping operations.

Returning to Medicine Hat I remained there for a few days and then left for Regina on July 16. Soon after my arrival I visited North Portal, accompanied by

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Inspectors Tambllyn and Robb, and while there obtained particulars regarding the installation of an engine for pumping purposes at the quarantine station.

The following day I stopped off at Moosejaw en route to Regina and interviewed Car Inspector Yake.

On July 21, accompanied by Inspector Tambllyn, I proceeded to Saskatoon and Prince Albert and interviewed the inspectors stationed at these points, and discussed matters with them relative to their work. We left the latter point on July 22 and interviewed a gentleman at Osler, who had previously forwarded complaints to you regarding the manner in which the veterinary inspectors were dealing with outbreaks of glanders. We discussed matters fully with him, and found that he had no actual knowledge of the nature of glanders, the mallein test, or of your policy in this connection, and that he had no personal criticisms to offer. He explained that he had made the complaints upon the request of a number of Germans, who were also unfamiliar with the regulations. Upon completing my investigation I was able to report that there was no real grievance in this district and that the inspectors had been performing their duties in a regular manner.

We returned to Regina on July 23, and two days later I left for Winnipeg, where I interviewed Inspector McGilvray and then proceeded to Ottawa.

During the month of August I visited Carp, and investigated a suspected outbreak of anthrax in that vicinity, which, however, proved to be one of black-quarter. The veterinarian reporting the case was, therefore, advised accordingly and the necessary vaccine forwarded.

On the 22nd of this month I visited Toronto, attended the meetings of the American Veterinary Association, and returned to Ottawa on the 25th, where I remained until September 8. On the latter date I left on an inspection tour of the boundary ports in the maritime provinces, arriving at Charlottetown on the 9th. At this point I interviewed Inspectors Pethick and Leckie, visited the Intercolonial Railway stock-yards, and also the sheds erected for the accommodation of stock on the Black Diamond Navigation Company's wharf.

I met Inspector Townsend at Pictou on the 11th, who accompanied me to New Glasgow, where I remained until evening, and then left for Sydney. I arrived there the following morning, and accompanied by Inspector Thurston proceeded to North Sydney, and inspected the Intercolonial Railway stock-yards, as also the accommodation provided for stock awaiting embarkation on the wharfs, and then returned to Sydney.

On September 13 I left for Halifax, where I visited the quarantine station and wharfs, and left the following day for Yarmouth to interview the inspector in charge of that port.

I proceeded to St. John on September 15 and, accompanied by Dr. Frink, visited the quarantine station and the Canadian Pacific Railway cattle-sheds.

On the 18th I visited McAdam Junction, interviewed the inspector in charge, and looked over the suitable available sites for a quarantine station.

The following day I returned to St. John, and after an interview with Inspector Frink, left for Ottawa. I remained at headquarters until September 25, when I left for the Sault Ste. Marie district, and looked into the hog cholera situation there, returning on October 3.

On the 16th of this month I visited Beaconsfield district and supervised the second dipping for export purposes of a flock of pure-bred Southdown sheep.

I visited Niagara Falls on November 5, where I met Dr. Watson and discussed with him and the owner the advisability of ear-marking a number of suspected reactors in a pure-bred herd of cattle, which had been tested with tuberculin supplied by this branch under the usual conditions. Your policy in this connection was clearly explained and these animals were ear-marked with the owner's consent in preference to holding them for the necessary period for retest.

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On my return to Niagara Falls I met Inspector Cooke, and with him interviewed the Michigan Central Railway authorities with a view to selecting a suitable site for their car-cleaning yard at Montrose. The site previously chosen by the company was found to be the most suitable and was therefore recommended.

I then left for Bridgeburg and interviewed the inspector at that port, after which I returned to Toronto, visited the office of this branch and arrived at headquarters on the 11th.

On the 13th I proceeded to the western provinces, and took charge of the work in the province of Saskatchewan during Inspector Tambllyn's absence. Soon after my arrival at Regina I found it necessary to proceed to Saskatoon to confirm a suspected outbreak of hog cholera. The disease, which was of a very virulent nature, was fortunately limited to one premises. These were well isolated, and by the enforcement of active, stringent measures no further outbreaks occurred in this vicinity.

Upon Inspector Tambllyn's return to Regina, I visited Moosejaw and Milestone with Inspectors McGilvray and Hargrave. At the former point I met the recently appointed western car and yard inspector, and instructed him fully regarding his duties. At Milestone we examined a number of cases of dourine, and witnessed an autopsy on one of them, conducted by Inspector Hargrave.

The following day I returned to Regina, Inspector Hargrave to Medicine Hat and McGilvray to Winnipeg. On December 15 I proceeded to Medicine Hat and interviewed Inspector Hargrave regarding a complaint relative to conditions at one of the quarantine stations on the Alberta boundary. We visited this station the following day, investigated the charges and found that there was little cause for complaint.

I returned to Regina December 18, and left the following day for Winnipeg. At the latter point I again interviewed Inspector McGilvray, and with him investigated an outbreak of Lip and Leg Ulceration in sheep some distance out of the city.

I left for Fort William and Port Arthur the same evening, and upon my arrival at the latter point, interviewed Inspector Fraser relative to the existing conditions in his district. We visited a few premises, where more or less trouble had been experienced in enforcing the hog cholera regulations, explained to the owners the necessity for their strict observance, and advised them to co-operate with this department in the eradication of this malady.

I then returned to Ottawa and remained at headquarters until January 4, when I proceeded to Fort Coulonge and held autopsies on the carcasses of cattle which had reacted to tuberculin supplied by this branch. The following day I returned to Ottawa, where I remained until the 21st. On the latter date I left for Windsor for the purpose of deciding upon a suitable location for the erection of a quarantine stable. After having chosen the site I looked into several other matters of importance at this point, and then proceeded to Sarnia, where I interviewed Inspector Brown. I then left for London, met Inspector Tennent and proceeded with him to St. Thomas, where we interviewed the Board of Health in connection with an outbreak of rabies in that city. I returned to headquarters on the 28th, and with the exception of a visit to Renfrew with Inspector Hall, on February 9, where we investigated a reported case of glanders, have since remained at headquarters.

A detailed report of each of the above investigations was forwarded to you upon completion of the work.

I have the honour to be, sir,

Your obedient servant,

GEORGE HILTON,

Chief Veterinary Inspector.

The Veterinary Director General,
Ottawa.

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APPENDIX No. 2.

R. BARNES, V.S., Chief, Meat Inspection Division.

OTTAWA, March 31, 1912.

SIR,—I have the honour to submit my annual report for the year ending March 31, 1912.

During the year my duties have been for the most part confined to your office. Short visits have been made to Montreal and Toronto and one or two other places in order to discuss and adjust minor points of difference which have arisen and which have been settled in a manner satisfactory to all concerned.

While there have been quite a number of additions to the staff, yet, owing to transfers to the Contagious Diseases Division, resignations and dismissals, I may say that the force is still barely sufficient to meet the increased needs of the service occasioned by the larger number of animals slaughtered during the past year at establishments operating under the Meat and Canned Foods Act and the number of new plants placed under inspection. This limitation is particularly evident during certain seasons when the slaughtering is so excessively heavy as to necessitate the operation of the plants during a part of the night, but this extra work has been carried on by the regular staff faithfully and with little complaint.

This condition, while unsatisfactory, is one that is very difficult to overcome. During the late winter and spring months, no more than a sufficient complement of officers is stationed at the different establishments to comfortably perform the required work. As summer approaches it becomes necessary to arrange for the annual vacations, and those who remain on duty must carry on the inspection. Fortunately at this season the slaughtering is the lightest of the year, which alone makes the present arrangement possible and fairly satisfactory. Beginning in the fall, however, and lasting well on into the winter months, the establishments are running to full capacity, and during this time your officers are obliged to return for from two to four hours night duty. It is unfortunate that just at this time, too, the staff is subject to a constant drain for temporary work in the maritime provinces, as also in the chicken canning factories in Ontario.

To this increased amount of work and strain, and to the fact that the work on the killing floors is carried on under conditions which at the best cannot be considered as ideal from a sanitary standpoint, may be attributed the somewhat unusual amount of sickness which during the winter months has affected many of your inspectors.

It is gratifying to know that the demand for meat and meat food products bearing the Inspection Legend is steadily increasing, and I feel assured that if the public fully appreciated all that such marking implies, viz: freedom from disease and the handling and preparation under sanitary conditions, the operation of uninspected slaughter houses would soon cease. In this connection I may say that the management of inspected establishments have not placed these facts before their purchasers by judicious advertising to the extent that might be possible.

Steady prices have prevailed throughout the year, which has, no doubt, been a factor in bringing forward to the markets the increase of, approximately, 50,000 sheep and lambs and 400,000 swine. While hundreds of poorly fed and unfinished cattle, as also grass-fed calves of inferior quality five to six months old, were killed, the

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total slaughter shows no increase over the preceding twelve months, which may be safely taken to indicate that the production of beef cattle is not keeping pace with that of other meat food animals.

During the past season, despite what a few years ago would have been considered prohibitive prices for canning purposes, a large number of factories engaged exclusively in the canning of poultry were placed under inspection. This may in a great measure be attributed to the high cost of all other meat foods making it possible for the manufacturer to place on the market a wholesome canned meat food at a price that would attract a purchaser, yet I feel that it is not presuming too much to say that the demand for this class of food has been to some extent increased by the assurance that it is actually what the label purports it to be.

Although the exports to Great Britain for the last twelve months show an increase over the previous year of 13 per cent, there have been imported from the United States by establishments under inspection 10,000,000 pounds of pork and pork products.

The total condemnations for disease in cattle show a marked decrease which may be attributed to the small number of old milch cows (canners) slaughtered, the managements of establishments apparently not wishing to run the risk of their condemnation.

The losses for disease in hogs show practically no change, yet the number of cattle and swine affected with tuberculosis shows a slight increase.

In cattle this is most marked in the older settled portions of the Dominion, and in hogs from dairy districts where the by-products from the manufacture of butter and cheese are not pasteurized. This is also applicable to districts where corn forms the principal feed for cattle and where the hogs are given the same run or yards.

The owners of establishments operating under the provisions of the Act and regulations have continued to show a desire to observe their requirements. Sanitary conditions have improved and thousands of dollars have been expended on additions and improvements whereby proper sanitation may be more easily maintained.

The agents of the various transportation companies have, with few exceptions, insisted upon the production of the certificates necessary in connection with the transportation of meat and meat food products in export trade.

The Meat and Canned Foods Act, having been in operation a little over four years, the Minister, on your suggestion, authorized the calling together of representatives of the packing and transportation interests for the purpose of discussing the various questions which naturally arise in the carrying out of the Act and the regulations made thereunder. The meeting was held on January 17, 1912, and was attended by a fair representation of the meat packers, as also of the transportation companies. Many minor matters were discussed and amicably adjusted.

The most important matter brought up, which was discussed very fully, was the admission into Canada of foreign uninspected meats and meat food products, their interprovincial transportation and their admission into establishments under inspection. No decision was arrived at, the matter being left in the hands of the Minister for consideration. Up to the present no pronouncement has been made.

It was pleasing to note the friendly spirit towards the department shown by the packers throughout the country, and the expression of their approval of the manner in which the requirements of the Act and the regulations have been administered, is much appreciated.

Under the provisions of Section 19 of the Meat and Canned Foods Act, an examination was held by officers of the branch on April 20 for the purpose of obtaining a list of men eligible to fill vacancies which occur from time to time in the service or to meet in some degree the needs occasioned by the rapid increase and extension of the work. Of the 85 veterinarians who presented themselves at this examination, 49 were successful in passing, and of these 12 were subsequently appointed to the Meat Inspection Division.

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FRUIT, VEGETABLES AND MILK.

Steady progress is being made in this line of the work. Your inspectors, while few in number, are zealous in the performance of their duties, and have been able to bring about without friction a wonderful improvement in the sanitary conditions of plants engaged in the manufacture of this class of food.

In order that the division may keep abreast of the rapid development of this trade, I am of the opinion that it will be necessary to make further additions to the staff of inspectors as, with the present force, it will be impossible to carry on an effective supervision of the many new plants already in course of erection and of those which will no doubt be built during the coming year.

I have the honour to be, sir,

Your obedient servant.

ROBT. BARNES,
Chief, Meat Inspection Division.

The Veterinary Director General,
Ottawa, Ont.

APPENDIX No. 3.

A. E. MOORE, D.V.S., Chief Travelling Inspector.

OTTAWA, March 31, 1912.

SIR,—I have the honour to submit to you this, my annual report, for the year ending March 31, 1912.

GLANDERS.

It is with much pleasure I am able to report that this is the first year since my appointment in which I have not personally met with a case of glanders.

I have tested 9 horses, which were suspected and reported by veterinarians, but none of these reacted. I found suspicion due to one of the following causes, namely,—collection of pus in the nasal sinuses, grease heel, injury to the head, and diseased teeth.

Only 4 horses were destroyed this year in the province of Ontario. These were contact horses from an outbreak of last year.

In the province of Quebec 19 horses were destroyed, nearly all in one or two districts where glanders has been prevalent in other years.

Seven horses were destroyed in the province of New Brunswick during the last of March, near the town of Chipman. It is believed that this outbreak came from American horses used in construction work of the Grand Trunk Pacific railway.

The compensation paid for glanders in the eastern provinces this year amounted to \$2,673.

TUBERCULOSIS.

I have tested 152 cattle on 12 different premises, 17 of which reacted. These cattle were under the special supervision of this Branch.

I also tested 76 cattle intended for export to the United States, 3 of which reacted.

I applied the intradermal test to 8 cattle, 2 gave a positive reaction, the other 6 did not respond. These cattle had previously been tested in the ordinary way. The results of both tests were identical.

In several instances I held post mortems on reacting cattle at the request of the owners and was able to demonstrate to them the disease in its different stages. I consider that such demonstrations are invaluable in educating the public on tuberculosis.

I have ear-marked 50 reacting cattle in 7 different herds. These cattle were tested by local veterinarians supplied with tuberculin from this Branch.

HOG CHOLERA.

All the serious outbreaks of hog cholera this year have occurred in the vicinities of cities, and in hogs which were fed on swill and garbage collected from the hotels and restaurants. I herewith add a report which I prepared for you some time ago and which may be of interest.

The following is the substance of this report:—

‘I have the honour to inform you that in accordance with your request, I have prepared a brief report with reference to outbreaks of hog cholera which I have dealt with, the origin of which is undoubtedly the feeding of uncooked city garbage and hotel swill

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The first outbreak of this kind that came to my notice occurred at Sudbury, Ont., in June, 1903. Four (4) premises were involved, 85 hogs died and 14 contacts were killed. Two of the owners were hotel men, feeding the swill from their own houses, the third owner a woman feeding swill collected around the town, and the other was a butcher who bought a lot of hogs from this woman. There was absolutely no other source of infection traceable. All the other hogs in the community were healthy and no outside hogs had been recently introduced into these herds.

In November, 1903, there was an isolated outbreak in a herd at Collingwood, Ont., no source of infection could be traced, but the owner was feeding the refuse from the packing-house. At this time there was more or less hog cholera scattered throughout Western Ontario, and it is quite possible that infected hogs may have been sent to the Collingwood packing-house.

In August and September, 1908, another outbreak occurred at Sudbury and Copper Cliff, starting on two farms where owners were feeding slaughter-house refuse and hotel swill. At first it was suspected that the disease was brought from near Wallaceburg, Ont., but a careful investigation was made on the premises where the hogs originated at Wallaceburg and no trace of hog cholera was found.

In August, 1908, hog cholera occurred on a farm at Toronto. Some 400 hogs died and 717 sick and contacts were slaughtered. The manager informed me that he had not bought a hog for nearly a year, and then only some boars from a farm where hog cholera had never been known to exist. No other hogs had come in contact with his since then.

The owner fed his swine on hotel refuse. On examining this refuse I found it contained nearly every conceivable thing, such as uncooked pork rinds, ham and sausage, poultry bones and bacon, chicken and other fowl viscera, beef refuse, mutton and real refuse, besides all kinds of vegetables and slops.

I am at a loss to know the origin of this outbreak unless it came through contaminated food.

In December, 1908, another outbreak occurred near Toronto, where 73 hogs died. No other source of infection could be attributed except from feeding the uncooked city swill.

In January, 1909, two more outbreaks occurred near Toronto. No source of infection could be discovered and both parties were feeding uncooked hotel swill. These two premises were several miles apart and there was no communication between them.

In September, 1909, quite a serious outbreak of hog cholera occurred at Ottawa. Fifteen (15) premises were involved, 170 sick and contact hogs killed and 54 died. In every instance garbage-fed hogs were the victims; absolutely no other source of infection could be found. Farmers' hogs in the same neighbourhood, which were never fed garbage, remained healthy.

Later, in September of 1909, I was called to Toronto to investigate an outbreak of hog cholera at Weston, 365 hogs being involved. There were no contacts or recent importations. The hogs were fed on uncooked hotel garbage from Toronto.

I carefully examined the garbage in both the Toronto and Ottawa outbreaks and I found a great many uncooked portions of pork, such as rinds from bacon and ham sausages, spoiled pork chops, roasts and portions of ham and shoulders. I found in Toronto whole strings of raw, sour, mouldy sausages. The owner informed me that it was a frequent occurrence to find a bushel basket full in their garbage collection.

In August an outbreak occurred at Sault Ste. Marie, and was principally dealt with by Inspector Perdue. I visited Sault Ste. Marie in September and I found, as did Dr. Perdue, that the outbreak was entirely among swill-fed hogs, and those in contact with them. No other source of infection could be found. Farmers' hogs in this neighbourhood not fed on garbage, remained healthy. The disease was found on twelve premises, 95 hogs died and 260 killed.

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'Last September I visited Winnipeg, Man., on account of hogs dying of hog cholera near that city. In company with Inspectors McGilvray and Macintosh I made a careful investigation, and in every case found that uncooked garbage-fed hogs were the ones affected. There was absolutely no other source of infection that could be found.

'Three outbreaks occurred a little later at Helen Mines, Ont. At first it was thought that the disease might have been taken there from Sault Ste. Marie. This might have been true in one case, but the other two of these outbreaks were, as far as I could determine, not in contact at all with the Sault Ste. Marie hogs, but were fed on the swill from the railroad construction and mining camps.

'In October of this year quite a serious outbreak of hog cholera occurred at Fort William and Port Arthur. This outbreak, as well as those at Winnipeg, Sault Ste. Marie and Kenora, was confined wholly to hogs fed on uncooked garbage. The disease started almost simultaneously on all the different premises in this district. There was absolutely no communication or exchange of hogs among these people and they were scattered in all directions.

'About the last of August or first of September the butchers of Fort William and Port Arthur ran very short of local pork (Canadian) and large shipments were rushed in from the Winnipeg packing-houses. It was from three to six weeks after this, as far as I can learn, that the first hogs began dying near Port Arthur. I was told by the buyers that these shipments consisted largely of United States pork.

'I made a very careful investigation of the whole district in company with Inspector Fraser, with the result that 622 hogs were killed on 24 premises, valued at \$5,500. Four hundred and seventy-five hogs died previous to our visit. The garbage-fed hogs in this district all developed the disease, with the exception of one lot. This lot was only fed a small quantity of garbage, which was obtained from a restaurant where only Canadian pork was used.

'I made an inspection of a large number of hogs not fed on garbage near Fort William and Port Arthur, but no evidence of hog cholera could be found. These premises at the Fort William and Port Arthur outbreaks are quite widely separate. All the garbage-fed hogs became sick about the same time, most of them the same week, and there was no communication between these different places.

'You will notice that all the western outbreaks of hog cholera occurred quite closely together, the one at Sault Ste. Marie started in August, at Winnipeg in September, at Kenora and Fort William, the first part of October.

'It is interesting to note that immediately previous to these outbreaks a large quantity of outside pork was shipped into these towns by the Winnipeg packers, who all handle large quantities of United States pork.

'In conclusion I wish to say that in my dealing with hotel swill-fed hogs, I have found the most repulsive conditions. The premises, with the exception of a very few, I found in a most unsanitary condition, many of them were indescribably filthy, and the stench almost unbearable, millions of flies swarmed around, rats, dogs and crows feeding off the decomposing garbage, in fact, everything reeking in filth.

I believe that this material should not be allowed to be fed except under strict supervision, not alone from the serious danger of spreading the hog cholera infection, but also from a sanitary standpoint.

SUSPECTED HOG CHOLERA.

During the year several veterinarians of Western Ontario reported suspected hog cholera. On investigation I found the conditions due to influenza and digestive derangements.

SHEEP SCAB.

During the early spring while investigating an outbreak of sheep scab at La Baie, in the province of Quebec, I heard a rumour that there was some suspected

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sheep at Louiseville, a place immediately across the St. Lawrence river from La Baie. On investigation I found several flocks affected, which resulted in our quarantining 227 sheep on 18 farms. This outbreak no doubt originated from across the river.

Late in April I again visited these places and made preparations for the dipping of all the quarantined sheep at La Baie and Louiseville. When the weather permitted, Inspectors Vigneau, Gauvin and Beaudry accomplished the dipping of these sheep in a most satisfactory manner. The usual two dippings in the lime and sulphur dip were ordered.

RABIES.

During the year I made several visits to Western Ontario with reference to the different rabies outbreaks in that part of the province. In several instances the local authorities co-operated with us in passing special by-laws of their own, which very materially assisted us.

Owing to the nature of this malady it is one of the most difficult and unsatisfactory diseases to control. I found that our local inspectors, however, had done excellent work in dealing with these outbreaks.

In February I visited Montreal to investigate a suspected case but found no evidence of rabies. I submitted the brain of the suspected dog to the pathologist for examination, with negative results.

ANTHRAX.

During the summer I visited North Ham, Quebec, to investigate quite a serious outbreak of anthrax, especially in horses in that district. Inspector Whyte, assisted by Inspector Beaudry, dealt with the details of this outbreak. After the vaccination of the exposed stock the disease was soon under control.

I was also called to Martintown, Ont., where two cattle died.

BLACK-QUARTER.

Several cases came to my notice in Ontario through reports of suspected anthrax. I gave the usual advice with reference to controlling this disease.

OTHER DISEASES.

In June a farmer from Newington, Ont., reported a disease in his horses. Acting on this report I visited his premises and found the malady to be cerebro-spinal meningitis.

In February it was reported by the local veterinarian that horses were dying near Glencoe, Ont. On investigation I found one horse dead and five others sick. I decided that the disease was caused by the feeding of mouldy corn stalks. After this food was discontinued the sick animals recovered.

INSPECTING IMPORT HORSES.

During the year I tested three horses in Ontario, which were imported from the United States. In October I examined fifty import horses at Sault Ste. Marie, our office at that point being absent at the time of this importation.

In November I visited Morrisburg for the purpose of inspecting two horses. I deemed it advisable to return them to the United States.

In March I tested a suspected import horse at Cobourg, which I found to be healthy.

DIPPING EXPORT SHEEP.

During the year I supervised the dipping of 126 sheep for export to the United States.

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BOUNDARY INSPECTION.

From time to time during the year I visited the following ports for the purpose of consulting with the different officers with regard to boundary inspection:—Quebec, Sherbrooke, Montreal, St. John's, Cornwall, Prescott, Morrisburg, Cobourg, Toronto, Niagara Falls, Bridgeburg and Windsor.

When not on duty travelling I have assisted with the office work of the Branch.

I have the honour to be, sir,

Your obedient servant,

A. E. MOORE,

Chief Travelling Inspector.

The Veterinary Director General,
Ottawa.

APPENDIX No. 4.

C. D. MCGILVRAY, M.D.V.,

WINNIPEG, Man., March 31, 1912.

SIR,—I have the honour to submit herewith report for the year ending March 31, 1912, in connection with the Health of Animals Branch in the province of Manitoba.

The work in connection with the branch here may, for convenience, be considered under three divisions, viz.:

Diseases of Animals Control Division.

Animals Quarantine Division.

Meat Inspection Division.

DISEASES OF ANIMALS CONTROL DIVISION.

The work in connection with this division, as the name implies, has consisted in dealing with the control and eradication of diseases coming under the Contagious Diseases of Animals Act, together with the enforcement of the various requirements of the regulations and ministerial orders relating thereto, as well also as the investigation, from time to time of such other diseases and conditions affecting the health of animals appearing to be of sufficient importance.

The diseases dealt with under this division by your officers of this branch were: glanders, hog cholera, mange in horses, mange in cattle, suspected sheep scab, necrobacillosis, or lip and leg ulceration of sheep, suspected dourine, tuberculosis, and blackleg.

GLANDERS.

The work in connection with the eradication of this disease is still seriously engaging our attention. The number of animals which we found it necessary to slaughter for glanders in Manitoba this year was somewhat larger than the preceding year and is owing to an outbreak being detected in the southwestern part of the province, adjacent to the international boundary. The evidence at hand indicates very clearly that the source of infection in this outbreak was introduced by animals from a certain section of the adjacent state of North Dakota.

GLANDERS STATISTICS FOR MANITOBA.

Summary, showing total number of horses and mules tested and destroyed during the year, by various inspectors here:—

Horses and mules submitted to test.

1st test, 627; 2nd test, 98.

Horses and mules destroyed for glanders.

1st test, 35; 2nd test, 2; without test, 1; total destroyed, 38.

Of this number 9 were clinical cases.

Total compensation allowed, \$3,389.98, being an average of \$87.10 per animal.

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Import horses tested at destination.

1st test, 303; 2nd test, 6.

All of which proved to be healthy.

HOG CHOLERA.

This serious affection of swine has fortunately only made its appearance on rare occasions in Manitoba. Dr. Dunbar, of Winnipeg, reported an outbreak which occurred at Kildonan during 1886, and Dr. Stevenson an outbreak near Carman in 1889. Since the latter time it has not made its appearance here until August, 1911, when it was reported to be in existence among pigs on premises near Winnipeg.

Upon the matter being reported to your office, Inspector A. E. Moore, of Ottawa, was detailed to work in conjunction with us and I desire to express appreciation of the assistance rendered by him. Associated also with Dr. Moore and myself were Inspectors Macintosh and Shonyo, who also displayed considerable zeal and energy in carrying out the work in the eradication of this troublesome disease.

Upon investigation it was found that the outbreak was of a very serious nature and existed on premises in districts where large numbers of swine were being kept. Efforts were therefore immediately directed towards controlling and eradicating the disease from the districts in which it existed, and at the same time to ascertain and determine the source of infection.

Searching inquiry failed to bring forth any evidence or information as to the infection having been introduced by fresh hogs brought into the district, and no fresh hogs had for some time prior to the detection of the outbreak been introduced on to any of the premises on which the disease first manifested itself. A curious and striking feature was that on all of the premises where the disease first manifested itself, the hogs thereon were being fed uncooked swill, kitchen refuse, and garbage, obtained from hotels in the city of Winnipeg, while on other premises in the same district, where they were not feeding such refuse and garbage, the hogs remained healthy and the disease did not manifest itself until a much later date and after ample time had elapsed for them to become affected either by direct or indirect contact, or intermediary means, from the premises where the disease already existed, and in such cases information was obtainable that the infection had been introduced by such means.

On page 18 of the report for the year ending March 31, 1911, of the Veterinary Director General, Dr. J. G. Rutherford, he refers to the possibility of outbreaks of hog cholera being started in suburban districts among swine being fed on uncooked garbage, and our experience and observations in connection with the recent outbreaks of hog cholera dealt with, indicate and support the theory as to fresh outbreaks originating from such a source.

While outbreaks dealt with by us in the district surrounding Winnipeg furnished strong circumstantial evidence in support of this theory, yet outbreaks at Kenora, Ont., furnished even more striking illustration and convincing proof thereof.

During October last, some disease was reported as causing the loss of a number of hogs on the premises of a Mr. H—— at Kenora, and, upon investigation, it was found that the owner of these hogs conducted a hotel at Kenora, and that the hogs were being fed on the swill and kitchen refuse from the hotel. The symptoms manifested by these hogs, as well as the post-mortem lesions, were characteristic of hog cholera. No fresh hogs had been introduced on to the premises in question for a period of one year prior to the time of the outbreak. Hogs were also found to be affected on the premises of three other owners, which were separated from each other by several miles, and upon each of which the swine were being fed uncooked swill and kitchen refuse obtained from hotels in Kenora. The disease manifested itself on all of these premises almost simultaneously, without any possibility of the infection being introduced either by contact or intermediate means from each other's premises.

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On two other premises in the same district, hog cholera was subsequently found to be in existence, but the infection in these cases was directly traceable to the introduction on to the premises of hogs which were obtained from one of the parties already referred to.

On further examination of all hogs on premises in the vicinity of Kenora, which were kept under observation and inspected at intervals covering a period of over three months, it was shown that the disease was only found affecting hogs which were being fed on uncooked kitchen refuse and garbage or on premises where garbage-fed hogs had been introduced.

Summing up the outbreak at Kenora, on four premises, 146 hogs were found to be affected, and on each of these premises the only information obtainable as to the source of infection was to the effect that they had been feeding uncooked swill or kitchen refuse obtained from certain hotels. On two other premises on which the disease was found to be in existence among 17 hogs, the source of infection was traceable to hogs having been introduced on to the premises which had been obtained from one of the parties whose hogs were being fed on uncooked hotel swill. The hogs which were thus obtained and introduced were the first to show evidences of the disease, and the history obtained was that the other hogs on the premises had been entirely healthy until coming into contact with the ones referred to. Hogs were inspected at 13 other premises in the Kenora district, the hogs on which, however, had not been fed uncooked swill or kitchen refuse, and these remained entirely healthy, although kept under observation for a period of over three months. Needless to state that during this period due precautions were exercised to prevent any possible infection being introduced from other infected premises.

Regarding the outbreaks in the districts surrounding Winnipeg, our experiences were very similar to those at Kenora. The disease appeared and manifested itself on premises on which the hogs were being fed uncooked swill or kitchen refuse, and then spread from such centres to other premises in the same district.

The question may arise in some minds as to why uncooked kitchen refuse and garbage may give rise to the disease. In this connection it was quite often found by us that hotel kitchen refuse and garbage which was being fed to hogs, contained quantities of pork products (especially sausage and pork cuttings). It also came to our notice that coincident with the appearance of the outbreak, large quantities of pork products from the United States had been imported into Winnipeg and that a distribution of these pork products was made to certain other districts, viz:—Kenora, Port Arthur and Fort William, and that shortly after the distribution of these products there followed, almost simultaneously, at each of these districts, outbreaks of hog cholera, and it would, therefore, appear quite probable that the meats in question had been infected.

The result of our investigations and inquiries therefore furnished very strong circumstantial evidence in support of the belief that many fresh outbreaks of hog cholera are started in suburban districts by feeding uncooked refuse and garbage containing pork or pork products to swine.

Moore, of Cornell, refers to a serious affection, other than hog cholera, occurring among swine as the result of their being fed on kitchen refuse containing certain alkalies. However, while kitchen refuse containing certain alkalies may no doubt be the cause of serious affections and losses among pigs, these alkalies could not have been the cause of the losses occurring among the pigs in the cases referred to, as when the pigs were introduced on to other premises, coming from any of those upon which this hotel swill was being fed, fresh outbreaks were started, showing that the disease was essentially of a contagious nature. Again on all premises which we kept under observation, where the hogs were being fed uncooked swill or kitchen refuse, sooner or later, the disease made its appearance and subsequently outbreaks occurred on other premises in close proximity.

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The disease having, in all likelihood, been introduced by this means, and involving premises over a considerable area, widely separated from each other, centres of infection were set up in many districts and serious outbreaks followed thereafter. Once the outbreaks became manifest, the infection was spread in many and varied ways. Among the possible means by which the infection was conveyed from place to place, which came under our notice, were:—by direct contact, that is diseased or contact hogs having been introduced from some of the other premises, or by the premises being in close proximity to each other. Evidences were found of the possibility of the infection having been carried by means of dogs, and where suspicion of this was aroused, steps were taken to prevent it. It was also brought to our notice that certain birds, especially crows and pigeons, appear to be responsible in spreading the disease from place to place. Suspicion was also aroused in many cases as to the infection having been introduced on to the premises by the feet of visitors and others. Again suspicion was also aroused as to the disease being carried in small streams which infected other premises through which the same stream had its course and on which piggeries were located.

The disease in the outbreaks in question appeared in both the acute and chronic types. At the beginning of the outbreaks the acute type was most in evidence and was more marked in severity, becoming less so with the lapse of time and approach of winter. This depended, no doubt, upon the virulence of type or strain of infection, which appeared to become weakened or attenuated with the lapse of time.

In the acute type the symptoms observed were:—sluggishness, capricious appetite, gumming or adhesiveness of the eyelids, accelerated breathing associated with cough in some cases; the appearance of reddened or purplish blotches on the skin, especially round the region of the ears and neck, the under surface of the abdomen and the inner thighs. The bowels, in some cases, were constipated, while in others diarrhœa was present. Progressive weakness, uncertain gait, terminating in loss of power of hind limbs, was frequently noticeable. In the acute cases, affected animals rapidly succumbed to the disease. Hogs ranging in age from two to six months, seemed to be more severely affected, and more rapidly succumbed to the disease than those older.

In chronic cases the same symptoms were in evidence, although less pronounced and the course of the disease more prolonged with progressive weakness and emaciation supervening.

Post mortem lesions were chiefly in evidence affecting the lymphatic glands, lungs, heart, kidneys, spleen and intestines. The lymphatic glands were usually observed to be markedly reddened and enlarged; the lungs showed many small ecchymosis and large pneumonic areas, dark red in colour, consolidated and sharply defined from the healthy lung. Ecchymosis were also observed on the heart surface. The kidneys were darker in colour than normal and presented numerous petechia (turkey egg appearance). The spleen in many cases was greatly enlarged, although in a few cases, it appeared smaller than normal. The intestines, in acute cases, where the duration of the disease had been short, petechia and ecchymosis were noticed on the outer surface, and on the inner surface areas of the mucosæ often appeared congested, inflamed, and more or less swollen.

In chronic cases somewhat similar lesions were observed as those in acute cases, together with characteristic ulcerations of the intestines, noticeably around the region of the ileo-cæcal valve, as well also as thickening of the mucosæ in other parts of the intestines.

While formerly the specific cause of hog cholera was thought to be due to the bacillus suis, it has in recent years been demonstrated by Dorset and others that this germ only plays the part of an associated or secondary invader and the true infective agent has not been demonstrated, but it is due to a filterable virus which is ultra-microscopic so that at present there is no means of determining the diagnosis of

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hog cholera, other than by the characteristic symptoms and post mortem lesions and its infectiveness or contagiousness to other hogs, which can be proved by the transmission of the blood from infected to healthy animals, as well also as by the placing of diseased animals in contact with healthy pigs, which, sooner or later, contract and develop the disease.

HOG CHOLERA STATISTICS FOR MANITOBA.

Number of premises inspected.	275
Number of swine inspected, approximate.	6,500
Number of premises on which the disease was found to exist.	62
Number of diseased and in-contact animals destroyed.	2,218

Total compensation allowed, \$12,358.52.

In addition to the above we also dealt with an outbreak of hog cholera at Kenora, Ont., where the following number of premises and animals were dealt with:—

Number of premises inspected.	21
Number of swine inspected.	299
Number of premises on which the disease was found to exist.	7
Number of diseased and in-contact animals destroyed.	163

Total compensation allowed, \$873.99.

All the premises inspected were re-inspected at intervals covering a period of three months and special attention was directed towards having the premises upon which diseased animals had been kept cleansed and disinfected in a satisfactory manner.

MANGE OF HORSES.

This disease was found to be affecting horses in a certain district in the province, the source of infection being from a consignment of horses shipped from the province of Alberta. The affected and contact animals were placed under quarantine restrictions, and owners instructed as to the proper treatment of affected animals, as well also as the satisfactory cleansing and disinfection of premises.

Total number of horses inspected for mange.	155
Total number of affected and contact animals quarantined.	76

MANGE OF CATTLE.

The outbreak which was detected last year, affecting a number of cattle in the Portage-la-Prairie district, has been eradicated, and the premises upon which it had been in existence, have been re-inspected from time to time, without any further evidence of the disease having been detected.

In accordance with the requirements of the Mange Regulations, all cattle originating west of Winnipeg are required to be unloaded and inspected at Winnipeg. Cattle destined for points east of Winnipeg are only allowed to proceed after being carefully inspected and accompanied by the inspector's health certificate. Cattle showing manifestations of mange are not allowed to go forward but are detained here and are allowed to be removed from the yards under an inspector's certificate for immediate slaughter only.

During the past year, the following number of cattle were inspected at the Winnipeg stock-yards:—

Destined for points east of Winnipeg.	32,203
For local consumption at Winnipeg.	67,495
Total.	99,698

Of this number 224 were found to be affected with mange.

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SUSPECTED SHEEP SCAB.

In accordance with the requirements of Ministerial Order No. 40, we inspected for scab 23,455 sheep imported from the United States, all of which appeared to be healthy. Of this number 226 were a consignment of breeding ewes, which were twice dipped in the official lime and sulphur dip, in the presence of an inspector. The remainder were for immediate slaughter only.

NECROBACILLOSIS—OR LIP AND LEG ULCERATION OF SHEEP.

During the month of December, 1911, it was reported to us that a number of sheep on premises at Glenlea, which had recently been shipped from Ontario, were affected with sores upon the mouth and feet, and, in company with Inspectors Hilton and Macintosh, I made an examination of the affected flock and found the lesions and symptoms to be characteristic of the condition known as necrobacillosis, or lip and leg ulceration of sheep. Swabs were taken from the sores on the affected animals and forwarded to the Biological Laboratory and a report was received from the pathologist, Dr. Higgins, to the effect that the disease was undoubtedly due to the bacillus necrophorus, which is the causative agent of the above affection of sheep.

Instructions were furnished owner as to the proper mode of treatment and precautions to be observed, with the result that the affected animals made good recovery.

One hundred and forty sheep were comprised in the flock, of which about 25 per cent were affected and showed well marked evidences of the disease.

DOURINE.

This disease has not been detected as affecting horses in this province. Three stallions which were reported as suspicious have been examined, but proved to be some benign affection and not dourine.

TUBERCULOSIS.

During the past year we have submitted to the tuberculin test one pure-bred heifer intended for export to the United States, which proved to be healthy.

I also submitted 38 head of cattle on the Brandon Experimental Farm to a first test, two of which re-acted and were permanently ear-marked, two being submitted to a second test. Two other animals, which were obtained to replace the two re-acting animals were also submitted to a first test.

There were also tested by practising veterinarians throughout the province, with tuberculin supplied by the Department, 112 head of cattle. Of this number 5 re-acted to the test and were officially ear-marked in accordance with the regulations, by regular officers of the Department.

TUBERCULOSIS STATISTICS FOR MANITOBA.

Cattle intended for Export to the United States.

One submitted to a first tuberculin test, which proved to be healthy.

Herds placed under the control of the Department.

Forty were submitted to a first tuberculin test.

Two were submitted to a second tuberculin test.

Two re-acted to a first tuberculin test, and were permanently ear-marked.

Cattle tested by Practising Veterinarians with Tuberculin supplied by the Department.

One hundred and twelve submitted to a first test by practising veterinarians.

One submitted to a re-test by officers of this Branch.

Five re-acted and were ear-marked by officers of this Branch.

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BLACKLEG.

This disease, which makes its appearance from time to time, is more or less indigenous to certain sections of the province, where it is reported affecting cattle. When the true nature of the disease is established, owners are advised to resort to vaccination of susceptible animals, their removal from infected pastures and the proper disposal of any carcasses of animals which have died from the disease.

Some mysterious disease affecting cattle was reported as causing considerable losses among cattle in the Woodlands districts, which was investigated and was found to be blackleg, and owners were advised as to the precautions to be observed.

During the past year we have supplied 225 doses of blackleg vaccine to owners for vaccination purposes.

INSPECTION OF LIVE STOCK CARS AND YARDS.

In accordance with the requirements of Ministerial Order No. 37, an inspector is stationed at the Winnipeg stockyards to supervise the cleansing and disinfection of all empty stock cars arriving at, or passing through, Winnipeg, unless bearing evidence of having been previously treated.

This work is conducted at the yards of the Canadian Pacific railway and the Canadian Northern railway.

	Cars.
At the Canadian Pacific railway yards there were cleansed and disinfected, under the supervision of our inspectors, during the year.	4,021
At the Canadian Northern yards there were cleansed and disinfected, under the supervision of our inspectors, during the year.	1,015
Total cars inspected.	5,036

The stockyards at Winnipeg, and elsewhere throughout the province, were also ordered to be cleansed and disinfected, under the supervision of the inspectors, from time to time, as exigencies required.

ANIMALS QUARANTINE DIVISION.

The work of this Division consists in the enforcement and carrying out of the requirements of the regulations relating to animals quarantine, the animals quarantine stations and inspection ports in Manitoba being at Emerson, Gretna, Bannerman and Snowflake.

During the past year there has been a considerable increase in the number of animals entering and inspected at these various ports.

EMERSON QUARANTINE STATION.

This station is located at Emerson, on the International Boundary line, at the point where the Canadian Northern and Canadian Pacific lines of railway, and their American connections, intersect.

The equipment and accommodation at this point consists of a fenced enclosure, 205 feet in length by 100 feet wide, together with stable accommodation for 100 horses and cattle, and also covered-in shed used for the detention of swine during the required period of quarantine. The main stable is well lighted and thoroughly ventilated. There is also an inspector's office and waiting-room for the use of settlers during the time their stock is undergoing inspection.

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Besides the inspector in charge, a caretaker is also maintained at this point, whose services are made use of in assisting the inspector and in keeping the yards and stables in good repair and cleanly condition, as well also as the cleansing and disinfection of the stables with limewash and carbolic acid, from time to time, as required.

During the past year there has been presented for entry and inspection at this station, the following number of animals:—

Horses, 11,626; mules, 1,372; cattle, 1,960; sheep, 15,271; goats, 4; swine, 57.
Fees collected, \$3,325.26.

Two thousand nine hundred and eighty-nine horses and mules were submitted to the mallein test, of which 21 were submitted to a second test, and 3 re-acted and were refused entry.

Forty-three head of cattle were submitted to the tuberculin test, all of which proved to be healthy.

GREYNA QUARANTINE STATION.

This station is located at Greyna, on the international boundary line, conveniently situated between the Canadian Pacific railway and the Midland Branch of the Great Northern railway, each of which lines has a branch spur running into the quarantine station.

The equipment consists of a substantially fenced enclosure 140 feet in length by 120 feet wide; stable 100 feet by 30 feet, providing accommodation for 45 animals, and which is well lighted and thoroughly ventilated.

Besides the inspector in charge, there is also maintained a caretaker, whose services are made use of in assisting the inspector in charge, keeping the yards and stables in good repair and cleanly condition, as well also as the cleansing and disinfection of the stable with limewash and carbolic acid, from time to time, as required.

During the past year there has been presented for entry and inspection at this station, the following number of animals:—

Horses, 2,160; mules, 436; cattle, 425; sheep, 228; goats, nil; swine, 1.
Fees collected, \$599.01.

Seven hundred and thirty-six horses and mules were submitted to the mallein test of which two were submitted to a second test, and 1 re-acted and was refused entry. One horse which had previously been presented and had re-acted to the mallein test, was slaughtered upon being again presented by the owner, for entry.

Two head of cattle were submitted to the tuberculin test and proved to be healthy.

BANNERMAN QUARANTINE STATION.

This station is situated on the B. S. & H. B. Branch of the Great Northern line of railway at Bannerman, and is distant from the international boundary line about three and a half miles.

The equipment consists of a substantially fenced enclosure, 140 feet in length, by 120 feet wide; stable 100 feet by 30 feet, providing accommodation for 45 animals. The stable is well lighted and thoroughly ventilated.

During the past year there has been presented for entry and inspection, the following number of animals:—

Horses, 499; mules, 11; cattle, 104; sheep, 1; goats, 1; swine, 1.
Fees collected, \$134.40.

One hundred and ninety-three horses and mules were submitted to a first mallein test, of which 5 were submitted to a second test, and 7 re-acted and were refused entry.

SNOWFLAKE INSPECTION PORT.

Snowflake, which is an inspection port only, is located on the Snowflake branch of the Canadian Pacific railway, distant about three miles from the international boundary line. The Department has rented a stable at this point, which provides

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accommodation for about 25 animals, and, up to the present, this has been sufficient to meet requirements.

During the past year there has been presented for entry and inspection at Snowflake, the following number of animals:—

Horses, 178; mules, 8; cattle, 61.

Fees collected, \$32.

One hundred and sixty-eight horses and mules were submitted to a first mallein test, and all proved to be healthy.

During the past year 2 head of oxen were also inspected at Sprague, which had been imported for work purposes, and fees amounting to \$1.50 were collected thereon.

SUMMARY, showing total number of animals presented for entry and inspection, and submitted to the mallein and tuberculin tests, at the various quarantine stations and inspection port in Manitoba:—

Horses and mules inspected.	16,290
Horses and mules submitted to a first mallein test	4,086
Horses and mules submitted to a second mallein test.	28
Horses and mules which re-acted and were refused entry.	11
Cattle inspected.	2,552
Cattle submitted to the tuberculin test.	45
Sheep inspected.	15,500
Goats inspected	5
Swine inspected.	59
Fees collected.	\$4,092 17

EXAMINATION OF THOROUGHBRED STALLIONS.

During the past year, I have, on instructions received from you, made an examination for soundness of the following thoroughbred stallions, standing for service:—

'KID'—315—Born 1907, owned by the Canadian National Bureau of Breeding, Ltd., Montreal, in charge of H. L. Flett, Binsearth, Man.

'ORACULUM'—137—Born 1904, owned by the Canadian National Bureau of Breeding, Ltd., Montreal, registered in the name of J. F. Ryan, Montreal, in charge of Baron de la Rue du Can, St. Rose du Lac, Man.

'EDWIN GUM'—181—Born 1903, owned by the Canadian National Bureau of Breeding, Ltd., Montreal; registered in the name of Wm. Walker, Toronto, Ont., in charge of Dr. J. P. Molloy, M.P., Morris, Man.

'VANCE GUARD'—166—Born 1907, owned by the Canadian National Bureau of Breeding, Ltd., Montreal, registered in the name of J. F. Ryan, Montreal, in charge of R. C. Cochran, Oak River, Man.

'LORICATE'—284—Born 1901, owned by the Canadian National Bureau of Breeding, Ltd., Montreal, in charge of Glen Campbell, Dauphin, Man.

'SENATOR CLAY'—183—Born 1904, owned by the Canadian National Bureau of Breeding, Ltd., Montreal, registered in the name of J. F. Ryan, Montreal, in charge of Thos. McNutt, M.P., Salteoats, Sask.

'WILD GRASS'—177—Born 1908, owned by Hutch, Harkness, Dauphin, Man.

MEAT INSPECTION DIVISION.

The work in connection with this Division is carried out by specially qualified inspectors trained in the work of meat inspection, and whose duties consist in the carrying out of the various requirements of the Meat and Canned Foods Act and the regulations relating thereto, at certain packing plants in the city of Winnipeg, viz:—

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The Swift Canadian Co., known as Establishment No. 18.

Messrs. Gordon, Ironsides & Fares, known as Establishment No. 19.

Messrs. Gallagher, Holman & LaFrance, known as Establishment No. 20.

The Western Packing Co., known as Establishment No. 21.

At each of these establishments a sufficient number of veterinary inspectors has been maintained to carry out the actual work of technical inspection of all animals both before and after slaughter, and, in this connection, during the greater part of the year, about twelve inspectors have been actively engaged in carrying out this work. During the latter part of the year this force was supplemented by the addition of three lay inspectors, to carry on work other than the actual technical inspection of animals slaughtered. Thus not only is a close inspection made of all animals slaughtered, but a close supervision is exercised over the further preparation of all meat and meat food products and the proper labelling thereof.

All of which is respectfully submitted.

I have the honour to be, sir,

Your obedient servant,

C. D. MCGILVRAY,

Inspector.

The Veterinary Director General,
Department of Agriculture,
Ottawa.

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APPENDIX No. 5.

D. S. TAMBLYN, D.V.S.

REGINA, SASK., March 31, 1912.

SIR,—I have the honour to submit herewith my annual report for the fiscal year ending March 31, 1912, for the province of Saskatchewan.

The work performed by the officers of the Health of Animals Branch of the Department of Agriculture is as follows:—

GLANDERS.

The eradication of glanders in the province of Saskatchewan is certainly a most serious question. This disease during the past two years has shown a considerable increase in spite of the stringent measures brought about to eradicate it. One of the most remarkable features in dealing with glanders during the past year, was the large number of clinical cases destroyed compared with those of the previous year. The policy adhered to in dealing with this disease, was that of dealing with all reported outbreaks, and the tracing of all direct contacts. This you agreed with me when at Ottawa last November, was the only satisfactory system to follow if glanders was to be brought under control in this province. I am fully aware of the difficulties surrounding the testing of contact animals, and I have continuously impressed upon the inspectors under my charge, that the utmost discretion should be used in selecting contacts when dealing with outbreaks of this disease. In this connection no hard and fast rule has been laid down, as it is next to impossible to draw the line as to which animals reported to our officers by the owners of diseased stock, are the real contacts, and which are not. While the following out of the policy of tracing all contact animals means an enormous amount of work and more assistance, nevertheless the work performed is efficient and not perfunctory.

The testing of range horses in the Maple Creek district during the past summer was completed with satisfactory results both to the owners and this Department.

The work performed by our officers in the Wood Mountain district was effective, and the employment of Range Rider Decock for the purpose of keeping the animals already tested, isolated from the range animals, was accepted by those who had their horses tested with a great deal of satisfaction and appreciation. There are still quite a number of bands listed which will be dealt with if possible this summer. The testing of range horses appears to me to be of the utmost importance, especially after our experience in the above mentioned districts. Had the testing of range horses in the district referred to, not been carried into effect, the majority of the animals destroyed would have this year been distributed to all parts of the province, especially in the case of the Ogle ranch, as I understand that the horses on this ranch have nearly all been disposed of. It will be remembered that our officers dealt with numerous outbreaks which were traced to animals which carried the Ogle brand, which is ipso facto evidence of the great risk involved in not insisting upon the compulsory testing of all range horses and mules.

A number of trips were made by me during the year to different parts of the province in connection with glanders. The results of their findings, together with the report of Dr. McGilvray, were communicated to your office.

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FIELD TESTS.

Total number of animals submitted to 1st mallein test . . .	13,167
Total number of animals submitted to 2nd mallein test . . .	4,147
Total number of animals submitted to 3rd mallein test . . .	900
Total number of animals submitted to 4th mallein test . . .	66
Total number of animals destroyed, 722; clinical cases, 242.	
Total value of animals destroyed, \$98,615.	
Total compensation, animals destroyed, \$65,743.33.	

Out of the above number of horses destroyed, twenty-two (22) were imports, valued at, \$3,295. No compensation.

Two horses included above as being destroyed were native horses, valued at, \$230. Compensation on these animals was withheld pending the action and decision of the Minister.

HOG CHOLERA.

In connection with Hog Cholera, I would say that the officers of this Branch dealt with a number of outbreaks in the districts of Swift Current and Saskatoon. Seven premises were placed under quarantine for this disease.

Total number of animals inspected	474
Total number of animals destroyed	158
Valuation, \$1,461; compensation, \$974.	
Number of animals died previous to inspection	124
Number of hogs found healthy and slaughtered for human consumption	75

One hundred and seventeen (117) hogs quarantined on suspicion were released, having been found healthy.

The history of each outbreak tends to prove that the infection was brought about through the feeding of swill obtained from hotels. The stringent measures enforced by our officers quickly brought this disease under control, and no premises remain at present under quarantine on account of this malady.

HORSE MANGE.

During the past fiscal year the number of outbreaks of Horse Mange showed a slight decrease, seventy-one (71) premises being placed under quarantine.

Total number of horses inspected and quarantined for Mange during the year	455
Total number of horses affected	102

I may also state that these animals have been reinspected from time to time by the officers of this department, and that 383 have been released from quarantine.

BLACK QUARTER.

This disease made its appearance in different parts of the province during the past year, and from the number of applications received for Black Leg Vaccine, it is apparent that this disease is somewhat on the increase. However, information and advice from a preventive point of view were issued from this office to the farmers who applied for vaccine. In two different outbreaks our officers were detailed to investigate same owing to the disease having been reported to this office as Anthrax, the results of these investigations proving negative.

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RABIES.

This disease was reported in the vicinity of Lloydminster and investigated by Inspector Head, with negative results.

DOURINE.

I regret to report that this disease made its appearance in two different districts during the past year. One outbreak occurred at Milestone, while the other made its appearance in the vicinity north of Unity.

In the Milestone outbreak the history tends to show that the source of infection was due to a consignment of stallions and mares imported from the State of Iowa, U.S.A. Inspector Hargrave, who was requested by you to investigate this outbreak, had no hesitation in diagnosing it as *Maladie du Coït*, and at your direction the majority of the inspectors of this province were given the opportunity of examining these cases which were typical of Dourine. Dr. Hargrave continued his investigations in the Unity outbreak, accompanied by Inspectors Olsen, W. L. Hawke and myself, and while the animals in this outbreak did not exhibit such marked symptoms as those in the Milestone outbreak, Dr. Hargrave came to the conclusion that the animals were affected, but in a very mild form. It was considered advisable, however, to postpone any action until such time as the services of the Assistant Pathologist, Dr. A. Watson, were available, when a serological test could be conducted and the affection positively diagnosed.

MALADIE DU COÏT.

Number of animals slaughtered.	5
Value.	\$1,050 00
Compensation.	\$500 00
Number of animals suspected and quarantined.	120

SHEEP SCAB.

This disease did not make its appearance in the province, but following your instructions to the effect that all sheep in the districts of Crane Lake and Maple Creek were to be inspected, owing to sheep scab being detected in the abattoir at Winnipeg, an officer of this branch was detailed to the above district with a view of carrying out your wishes in this respect.

Total number of sheep inspected, 33,950, all of which were free from disease.

The officers of this branch also superintended the shipping of 21,444 sheep imported for immediate slaughter, which animals were allowed to proceed from the port of Wood Mountain to Morse, Sask., for shipment to different abattoirs in the provinces of Saskatchewan and Manitoba.

These measures were necessary to prevent them from coming in contact with Canadian sheep, or being disposed of by the importers for other purposes.

Nine hundred (900) import sheep and four hundred and fifty-two (452) lambs were quarantined on the premises of D. J. White at Little Woody, Sask. These animals were released at the termination of thirty (30) days, being found free from scab.

TUBERCULOSIS.

This office has been called upon to supply tuberculin to a number of private practitioners at the request of owners, for the purpose of submitting their cattle to the tuberculin test.

One hundred and twenty-seven (127) cattle were submitted to first test, seventy-two (72) by private practitioners, and fifty-five (55) by the officers of this Department, thirty-nine (39) of the latter number being the cattle of the Experimental

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Farm at Indian Head. The number of cattle retested by our officers during the past year was 2, while 8 head were ear-marked.

INSPECTION STOCK YARDS AND STOCK CARS.

This work has been carried out in a more practical manner during the past year by the railway companies in this province, and the difficulties experienced by our officers at Moosejaw last year in compelling the Canadian Pacific Railway Company to live up to the regulations in this respect, has been overcome, which goes to show a certain amount of increased efficiency in connection with this work.

FIELD OFFICERS MOVEMENTS.

The following officers were added to the Saskatchewan staff during the past year:—Messrs. McLeish, Monroe, Blackwood, Hawke, Colebourn and Aikenhead. The last-named officer resigned his appointment on December 1, 1911, while Inspectors Colebourn and Monroe were transferred to the Meat Inspection Division in other provinces.

Inspector J. H. George was detailed to work in this province for a short period, after which he returned to the Meat Inspection Division.

Inspector H. W. Mustard was transferred to Calgary.

The procuring of a satisfactory clerk for the Regina office has been a source of trouble, especially when taking into consideration the enormous amount of clerical work dealt with at certain periods of the year. Mr. Mannsell, who succeeded Mr. O'Connell, resigned his appointment on August 20, 1911, and was succeeded by Mr. E. Brewis, who is, I am pleased to say, fairly well conversant with the work of the Department, while Miss Creswell, the stenographer, is also deserving of a considerable amount of praise for the manner in which she has conducted her share of the work.

However, I think that the time has arrived when the staff should be increased by the addition of a Veterinary Inspector, which will permit my devoting more attention to field work, which I may say is of the utmost importance in supervising the work of a department of this nature, whereas at present I find it impossible to leave the office for any length of time owing to pressure of work.

BOUNDARY INSPECTIONS.

In connection with boundary import work in this province, I beg to state that the work required detailing Inspectors McMurtry, George and Poole to the port of North Portal during the rush of immigration. The completion of the water system at that point for the accommodation of settlers and importers of stock in general, is being greatly appreciated, and what with other minor improvements, it tends to greatly increase the efficiency of the work of this Department. Inspector Chester, who was transferred to British Columbia owing to ill health, was succeeded by Inspector M. Barker, which officer has shown considerable interest in the work allotted to him.

The construction of new stables at Willow Creek, which were completed early in the year, greatly increased the facilities at that point. The services of Inspector Lesperance, who was in charge of Willow Creek for some months, were dispensed with by order in council under date of January 20, 1912. This port has since been in charge of Inspector H. L. Dixon.

Inspector Acres, the officer in charge at Marienthal, was transferred to Grand Forks, B.C., and was succeeded by Inspector E. A. Meakings on February 21, the latter officer being re-engaged by this Department.

Relative to the facilities at Marienthal, Big Muddy and Wood Mountain, I would recommend that just as soon as the railway construction work is completed along the international boundary line, stables and corrals be built.

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I would also recommend the building of six-room houses for the accommodation of our officers at all boundary ports. This will have beneficial effects in the way of keeping them more permanently at these points.

NORTH PORTAL QUARANTINE STATION.

The following figures show the number of animals presented for entry and inspection at the port of North Portal during the past fiscal year:—

Horses.	Mules.	Cattle.	Sheep.	Swine.	Goats.	Asses.	Fees Collected.
13,976 (290)	1,166 (8)	5,377 (602)	231 (3)	17	8	6	\$3,604.42

Two thousand eight hundred and forty-one horses and mules were submitted to 1st mallein test.

Three hundred and forty-eight were submitted to 2nd mallein test.

Thirty-two to 3rd mallein test.

One hundred and seventy-one horses and mules reacted and were refused admission.

Eleven thousand and thirty-two were accompanied by B. A. I. charts.

Eleven horses were rejected for mange, and 13 allowed to proceed to destination under license, there to remain isolated until re-tested and released by our officers.

WOOD MOUNTAIN QUARANTINE STATION.

The following figures show the number of animals presented for entry and inspection at this port during the past fiscal year:

Horses.	Mules.	Cattle.	Sheep.	Swine.	Goats.	Asses.	Fees Collected.
1,118 (76)	24	2	21,444 (432)	.....	8 (2)	.....	\$985.60

Seven hundred and seventy-four horses and mules were submitted to the 1st mallein test and 15 to 2nd test. Six reacted and were permanently rejected.

Thirty-one horses accompanied by B. A. I. charts.

BIG MUDDY QUARANTINE STATION.

The following figures show the number of animals presented for entry and inspection at the port of Big Muddy during the past fiscal year:—

Horses.	Mules.	Cattle.	Sheep.	Swine.	Goats.	Asses.	Fees Collected.
880	12	59	1	.....	.....	.....	\$301.50

Two hundred and fifty-five (255) horses were submitted to the 1st mallein test, and ten to the second. Ten horses and mules reacted and were rejected.

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One hundred and ninety (190) horses and mules were accompanied by B. A. I. mallein test charts.

WILLOW CREEK QUARANTINE STATION.

The following figures show the number of animals presented for entry and inspection at the port of Willow Creek during the past fiscal year:—

Horses.	Mules.	Cattle.	Sheep.	Swine.	Goats.	Asses.	Fees Collected.
1,344 (126)	64	26	12,700	.....	.....	1	\$762.00

Five hundred and ninety-two (592) horses and mules were submitted to 1st mallein test, seventy-four (74) to 2nd, twelve (12) reacted and were rejected.

Seven hundred and forty-seven (747) horses and mules accompanied by B. A. I. mallein test charts.

One hundred and twenty-nine (129) horses and mules allowed to proceed on license to destination.

MARIENTHAL (Inspection Port).

The following figures show the number of animals presented for entry and inspection at this port during the past fiscal year:—

Horses.	Mules.	Cattle.	Sheep.	Swine.	Goats.	Asses.	Fees Collected.
846 (64)	21	250 (41)	1 (2)	.....	.....	.....	\$291.10

Six hundred and sixty-eight (668) horses and mules were submitted to 1st test, one to 2nd test. Nine (9) reacted and were rejected. One hundred and thirty-four (134) were accompanied by B. A. I. mallein test charts.

The following is a summary showing the total number of animals presented for entry and inspection, and the number of mallein tests conducted at the various quarantine and inspection ports in the province of Saskatchewan.

Horses and mules inspected.. . . .	19,451 (559)
Horses and mules submitted to 1st mallein test.. . .	5,130
Horses and mules submitted to 2nd mallein test.. . .	478
Horses and mules submitted to 3rd mallein test.. . .	32
Horses and mules reacted and rejected.. . . .	208
Cattle inspected.. . . .	5,714 (643)
Sheep inspected.. . . .	34,377 (457)
Goats inspected.. . . .	16 (2)
Swine inspected	17
Asses inspected.. . . .	7
Total amount of fees collected.. . . .	\$5,944.62

I have the honour to be, sir,

Your obedient servant,

The Veterinary Director General,
Ottawa, Ont.

D. TAMBLYN,
Inspector.

APPENDIX No. 6.

J. C. HARGRAVE, D.V.S.

DOMINION OF CANADA,

MEDICINE HAT, August 12, 1912.

SIR,—I have the honour to submit herewith my annual report for the province of Alberta, south-eastern British Columbia and a portion of south-western Saskatchewan, for the year ending March 31, 1912.

I find it again necessary to report that during that period your inspectors within the area mentioned have at all times been actively engaged dealing with the various contagious and infectious diseases as are found and have been for some time prevalent in that territory. It is possible that the major portion of the time of the inspectors has been taken up dealing with the mange situation within the area covered by the special order relating thereto within the southern portion of Alberta and the south-western portion of Saskatchewan. In dealing with and endeavouring to control this disease, a great deal of attention on the part of the inspector is necessary and often resulting in very little to be shown for the efforts made.

While the situation generally speaking is somewhat better than that reported a year ago, yet there is much left to be desired, but, were it not for the antipathy that continues yet to be exhibited towards the efforts put forward by your inspectors, such would possibly not be the case, as in possibly every sub-district there are yet to be found individuals who deem the prerogative of the Department an interference that they do not care to tolerate, and one frequently finds that the efforts made by such individuals, in compliance with such orders as have been issued by your inspectors in compliance with the regulations, are perfunctory in the extreme.

During the year I inspected shipments of live stock to points outside of the province of Alberta as follows:—

Horses.	1,141
Mules.	3
Cattle.	343
	(calves 121)

MALADIE DU COIT.

While the number of cases of this disease during the year have not been so great as last year, yet we have had a recurrence of the disease in a territory in which we thought the disease had been cleaned up, which only illustrates the fact that there are cases of this disease which progress very insidiously and exhibit symptoms that even to the expert are not discernible, and also demonstrates the necessity of maintaining quarantines for a considerable length of time, as pointed out in previous annual reports. Even after the greatest endeavour has been made, often it is difficult and very often impossible to determine the source of infection of the various outbreaks.

During the latter part of the year, Dr. Watson, our pathologist, who has devoted considerable time to the work on this disease, was granted a lengthy leave of absence to afford him an opportunity of visiting the laboratories in England and Germany with a view to comparing the disease in this country with the same disease as exists in European countries, and it is to be hoped that the knowledge gained through such privilege will prove to be of benefit to the Department, particularly in the eradication of this disease from the western provinces.

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Statistics for Alberta:—

Number slaughtered.. . . .	13
Value (including one reg. animal).. . . .	\$1,760 00
Compensation (including one reg. animal).. . . .	\$1,173 33
Number suspected and quarantined.. . . .	89

Statistics for Saskatchewan:—

Number slaughtered.. . . .	5
Value (including 2 purebreds).. . . .	\$1,000 00
Compensation (including 2 purebreds).. . . .	\$700 00
Number suspected and quarantined.. . . .	112

The above figures would indicate that throughout the province of Alberta a considerable less number of horses were infected than during the previous year, although the disease had been introduced into the province of Saskatchewan. In this province two outbreaks were detected, one in the northern portion, the source of origin of which could not be determined; the other in the southern portion of the province which, from the history obtained, beyond the question of a doubt originated through the importation of an infected horse brought from the State of Iowa, but a considerable period elapsed before the outbreak in question was located. We, however, got the situation under control without finding any great number of contact animals, of which contact animals some four (4) head only have so far exhibited symptoms of the disease.

GLANDERS.

While a year ago I reported the number of cases detected to be few in comparison with the year previous, yet this year your inspectors have slaughtered a number slightly larger than last year, and from the history obtained in each outbreak, and the fact that the various outbreaks were scattered throughout the province, convinces one that there is yet a considerable amount of this disease within the province.

When one realizes that we as yet have only some two or three Inspectors in the northern half of the province, through which area there are to be found a large number of settlers that have immigrated from the United States as well as other provinces within the Dominion, it is only reasonable to expect that we shall sooner or later find centres of infection, and I think possibly that, particularly during the summer months, the services of an additional Inspector or two could be used to advantage if for no other purpose than a general inspection of live stock in that portion of the province referred to.

GLANDERS STATISTICS FOR BRITISH COLUMBIA.

(Crowsnest District.)

Native horses slaughtered.. . . .	1
Value.. . . .	\$60 00
Compensation.. . . .	\$40 00
Native horses (returning from U.S.) tested once.. . . .	14
Native horses (returning from the U.S.) tested twice	13

GLANDERS STATISTICS FOR ALBERTA.

Native horses tested once.. . . .	2,039
“ “ “ twice.. . . .	248
“ “ “ thrice.. . . .	8
Ceased re-actors re-tested.. . . .	1
Native horses slaughtered on 1st test.. . . .	41
Native horses slaughtered on 2nd test.. . . .	4

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Total value, \$6,950; compensation, \$4,633.32.

Of the number slaughtered twenty (20) head presented clinical symptoms.

Import horses tested once.	52
Import horses tested twice.	15
Settler's horses seized by Customs, tested and sold and fees collected.	2
Fees.	\$1 75

In addition to which fees on Customs seizures of horses amounting to 66 head were collected totalling \$46.25, of which number twelve (12) head were tested, the balance were tested at the boundary, at which point they were given a settler's entry and afterwards were seized by the Customs Department, as the entry at Coutts was found to be fraudulent.

SASKATCHEWAN.

Native horses tested once.	139
" " " twice.	26
" " " thrice.	6
" " " four times.	6
" " slaughtered on first test.	3
Value.	\$450 00
Compensation.	\$300 00
Import horses tested once.	402

HORSE MANGE.

Were it not for an outbreak of this disease amongst horses found by Inspector Cawsey in the Hardisty district I would be able to report this province practically free from the disease. The outbreak in question, however, was energetically dealt with, and I believe ere long it will be my privilege to report the eradication of this disease in the province.

CATTLE MANGE.

This disease I am afraid we are to have with us always, although the figures would indicate that it is gradually being confined to smaller areas. This is due no doubt to the fact that the ranching areas have been curtailed to a considerable extent. The farmers having taken up large tracts of what was formerly open range and fencing them in small areas has prevented very largely the drifting of cattle from one district to another, with the result that once we free certain districts of the disease there is not the same liability of re-infection, and it is possible that within a few years the disease may be eradicated.

Statistics for the past year:—

HORSE MANGE.

Number of premises dealt with.	36
" " horses quarantined.	477
" " " presenting symptoms of mange.	78

CATTLE MANGE—ALBERTA.

Number of herds quarantined.	441
" " cattle "	116,690
" " " dipped twice.	89,022
" " " " once.	106,527
" " " hand treated.	1,063

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CATTLE MANGE.—SASKATCHEWAN.

Number of herds quarantined.	79
“ “ cattle “	16,608
“ “ “ dipped twice.	17,595
“ “ “ “ once.	18,945
“ “ “ hand treated.	297

TUBERCULOSIS.

Tuberculin test was applied to 33 head of cattle by private veterinarians with tuberculin supplied through this office. Of these three reacted, and were so dealt with and two gave a suspicious re-action.

BLACK QUARTER.

Sales of Blackleg Vaccine amounting to \$62.60 were made during the year. This, however, does not represent amount of vaccine sold throughout the province, as a large number of sales were made by druggists in the various cities and towns, who keep a supply on hand.

RABIES.

It is gratifying indeed to be able to advise you that, since the outbreak successfully dealt with in the Red Deer district some time ago, there has been no further evidence of this disease within the province. Practically eighteen months have elapsed since the quarantine placed in connection with that outbreak was terminated.

HOG CHOLERA.

This disease has continued to make its appearance throughout the southern part of the province, and I think can in almost every instance be attributed to the feeding of uncooked garbage, although in one or two outbreaks the disease was carried from infected premises to those adjoining. Stringent measures were, however, adopted in each case and no further cases in each particular district have occurred.

Number of premises dealt with during the year.	24
Number of diseased hogs slaughtered.	316
Value, \$2,258.20. Compensation, \$1,505.45.	

In addition to the above 355 hogs were slaughtered and found fit for consumption.

BOUNDARY STATIONS.

The number of quarantine stations under the jurisdiction of this office is 5. Two of these are located in the southeastern portion of British Columbia and at each port a regular officer is located. No improvements have been added to any of them during the past year.

Pendant d'Oreille.

Entries at this Port:—

Horses, 497; mules, 1; cattle, 5; sheep, 12,174.

Number of re-actors (returned to U.S.), 1; contacts, 3.

Coutts.

Entries at this port:—

Horses, 2,981; mules, 118; cattle, 40; sheep, 32,870; swine 7; goats, 48.

Number of re-actors, nil.

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Twin Lakes.

Entries at this Port:—

Horses, 1,249, (foals 190); mules, 2; sheep, 810.

Number of reactors (returned to U.S.), 1; contacts 5.

Gateway.

Entries at this Port:—

Horses, 250; mules, 26; cattle, 9; buffalo, 15.

Number of reactors (returned to U.S.), 2; contacts 16, three of which were returned to the United States, thirteen (13) of which were admitted and retested at destination.

Kingsgate.

Entries at this Port:—

Horses, 2,754 (foals 102); mules, 96; cattle, 166; sheep, 8; buffalo, 7; elk, 7.

Number of re-actors, nil.

Total inspections of stock shipments from within the infected area to points outside of the province of Alberta, as follows:—

Horses and mules, 9,909; cattle, 40,284.

In addition to the above a very large number of different classes of stock have been inspected by your inspectors for shipment from one point to another within the area taking a great amount of time and careful attention.

I have the honour to be, sir,

Your obedient servant,

J. C. HARGRAVE,

Inspector.

To the Veterinary Director General,
Ottawa, Ont.

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APPENDIX No. 7.

ANNUAL REPORT

S. F. TOLMIE, V.S.

VICTORIA, B.C., March 31, 1912.

SIR,—I have the honour to submit my annual report for the year ending March 31, 1912.

Boundary Inspection.

Boundary inspection is steadily increasing in this province. During the year just ended 4,266 horses, 202 mules, 547 cattle, 75,777 sheep, 70 colts, 64 calves, 1,094 goats and 18 swine were inspected. Sixty-eight horses and one cow were rejected. Twenty-six cattle were tested with tuberculin for export to the United States. One cow re-acted and was destroyed.

\$4,631.18 in fees were collected.

With the exception of Rykerts all the ports on the boundary are provided with suitable stable accommodation for inspection work. This greatly facilitates the operations of your inspectors. New stables are now being completed at Vancouver, White Rock and Keremeos.

Contagious Diseases.

It is pleasing to note that no serious fresh outbreaks of contagious disease have occurred. But little glanders has been encountered. Fifty-five local horses were tested with mallein; six re-actors destroyed and \$540 in compensation paid.

Only two outbreaks of hog cholera have occurred. Total number of swine died, 68; slaughtered, 58, and \$342 compensation paid. This is very satisfactory after our experience of some previous years when the losses from these two diseases were quite heavy.

In the area quarantined for cattle mange at Kamloops, work has been progressing steadily with a view to eradicating the disease.

The inspectors on the ground in charge of this work have had many difficulties to contend with, due to the broken and partially timbered condition of the country, making it difficult to secure a clean gather of the cattle at a season of the year when dipping is practicable. Owing to the fact that the disease had not made much progress when first discovered, many of the stockmen interested do not seem to realize the serious losses that will be experienced in the event of mange gaining a good foothold and some do not show a disposition to use remedial and preventative measures with that energy which the circumstances require. I am sure that if they were to combine and co-operate heartily with the inspectors in charge, the district could be cleaned up in short order.

Reports show, however, that satisfactory progress has been made under the circumstances, and mangy cattle are not now nearly so much in evidence as they were when the work was first taken up.

I am glad to report that neither dourine nor sheep scab are to be found in this province.

The Red Water investigation is being continued by Assistant Pathologist Hadwen. He has been provided with suitable equipment at the Agassiz Experimental

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Farm, and he is now conducting a number of experiments in connection with the disease that should prove of great value.

A number of reports of suspected contagious disease have been investigated from time to time, but in many instances the animals were found to be suffering from diseases not covered by the Animals Contagious Diseases Act.

The practice of feeding uncooked swill to swine is quite prevalent in this province. Many of the feeders do not recognize the danger in following this practice. As you are aware many of our outbreaks of hog cholera in British Columbia are attributed to this cause. The remedy seems to lie in the education of swine owners regarding the dangers of raw swill. This could be done by issuing a bulletin giving full information on the subject or by carrying on a campaign of education through the medium of the Farmers' Institutes.

The inspection of stock cars has been more rigidly enforced than ever. 2,658 stock cars were cleansed and disinfected under the supervision of your inspectors. Public stock yards are maintained in a fairly satisfactory condition and when reported or found unsatisfactory prompt measures are taken to have the conditions remedied.

I have the honour to be, sir,

Your obedient servant,

S. F. TOLMIE,

Inspector.

The, Veterinary Director General,
Ottawa, Ont.

APPENDIX No. 8.

C. H. HIGGINS, B.Sc., D.V.S., F.R.M.S., Pathologist.

OTTAWA, March 30, 1912.

SIR,—I have the honour to transmit this my annual report as Pathologist to the Department for the year just ended.

The technical staff of the laboratory during the year has included besides myself, Drs. Wickware, Evans and Reid. Dr. Evans was sent by you in October last to Lethbridge for the purpose of relieving Dr. Watson during a temporary absence of a few months, and returned to the laboratory on March 28. Dr. Reid, whom you directed to report to the laboratory on July 12 last, has been attached to the staff since that time. Dr. Wickware has been on duty at the laboratory during the entire year. The lay assistants comprise Mr. Fee, the caretaker, who has occupied that position for a number of years, and Mr. A. Abraham, temporarily attached.

Drs. Wickware, Evans and Reid have shown great interest in their respective duties, and have also rendered valuable assistance in the conduct of the work of the laboratory. As instanced in my report of last year, the *esprit de corps* has been excellent among the members of my staff, and the specialization of each individual along certain specified lines has simplified the method of completing in the shortest possible time any investigation with which we may have been confronted. Each has given special attention to some particular feature of the work, yet all have been given the opportunity of familiarizing themselves with the progress of any special work that may have been the subject of investigation. As the work increases, it will be necessary to develop each assistant along more highly specialized lines in order to meet the many new problems which are continually confronting us from time to time.

Some attention has been given to original research, but our efforts in this connection have not been as productive of results as one would wish on account of the time available in this effort, which has been very limited.

Many valuable specimens have been received during the year, and minor studies have been commenced in a number of instances which I hope that we may be able to prepare and issue in the form of special circulars or bulletins for distribution among interested parties. The material which can be utilized with profit for advanced studies has been laid aside pending a time when we can systematically take up its detailed consideration and bearing on practical problems connected with the work of the branch as a whole. During the year we have dealt with 720 series of specimens as compared with 423 series for the year preceding.

A very wide variety of specimens is included in the above. Those received from inspectors of the Meat Inspection Division, have, as a rule, been forwarded for the purpose of establishing a diagnosis and the passing of a judgment. The specimens from other sources have been forwarded for general diagnostic purposes with a request for assistance to combat the affection. Many of these latter have dealt with problems associated with the poultry interests, some of which are of vital importance. In all instances it has been our endeavour to meet the exigencies of the case in hand with the least possible delay. The increasing occurrence of affections of a parasitic origin points to the desirability of having a member of the laboratory staff devote himself to such problems in a manner that has heretofore been impossible. In a number of instances parasitic infestations have been found upon which we have no

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literature, and to which we have been unable to find reference. These require further study before we can hope to offer intelligent advice for their control.

I regret that the much needed addition to the laboratory building is not yet available for our use, and it is to be hoped that this may be proceeded with at an early date, as it will enable us to conduct our work with greater facility and less danger than is at present possible. We found ourselves greatly crowded a year ago, and this crowding has become more acute, much of our work suffering in consequence.

Without further dilating upon the general features connected with the work of the laboratory, I will deal with a number of special subjects which are important considerations, not only from the laboratory view point, but, of the branch as a whole.

INCREASED ACCOMMODATION.

The need for increased accommodation is at present more urgent than at any time during the past four years. All of our available space is being made use of, and, at times we are so greatly crowded that the danger to individuals is greater than it should be. It has been my aim, in the conduct of the work of the laboratory, to eliminate, as far as possible, the danger of infection to individual workers. This, however, is largely dependent upon the laboratory facilities. At the present moment, we require an increased amount of room for our various duties in order that the hazard to individuals may be decreased.

While an increase in accommodation is necessary in connection with the routine and special laboratory work, it is desirable that we should be in a position to adequately justify, from an experimental standpoint, any ruling which it may be necessary for us to make. We should also be able to consider experimental work of an advanced nature in connection with diseases which the branch is endeavouring to control, not only in an endeavour to ensure accurate diagnoses, but to enable us to base any opinion on sound experimental data.

There is a necessity for us to increase the ordinary accommodation required for our small experimental animals. These small animals, which are a necessity in connection with any experimental work are difficult to secure, and we are, therefore, forced to breed what we require for our own use. There seems to be a general shortage of small animals among scientific institutions, a result of improved methods of diagnosis. In all probability no single experimental method of diagnosis has contributed to this shortage to such a degree as the Wasserman reaction for the diagnosis of syphilis in the human being. As a similar method of diagnosis is being experimented with by us for the diagnosis of certain diseases in animals, we should so enlarge our accommodation as to provide a suitable supply for this work. These small animals cannot be purchased when required, and in securing them from indiscriminate sources we jeopardize our stock through the danger of introducing an infectious disease.

Our present accommodation does not provide adequate space for this purpose, nor are our storage facilities satisfactory for supplying the most suitable food for keeping them in a high state of health during the late winter and early spring months, with the result that we are entirely dependent on accidental sources for our food supply at this time of the year. A suitable root cellar in connection with a commodious building for their housing will meet our requirements.

BIOLOGICAL PRODUCTS.

The manufacture of biological products has been maintained throughout the year without interruption and their quality, as indicated by our laboratory and other tests, has been satisfactory.

We are of the opinion that all such products for use in connection with the detection of disease in animals or designed as preventive or curative agencies should comply with certain standards. Aside from the products manufactured at this labo-

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ratory, there is no supervision, either as regards purity or potency of material, manufactured for similar purposes, designed for use in Canada. Further, there is no means of determining the amount of the importation of such products as tuberculin and mallein, for the general testing of cattle and horses. Such testing may be done, either to determine the existence of disease, or to nullify the results of a properly conducted examination with these agencies, under competent supervision. The commercial firms supplying these products in the past have exhibited a high degree of integrity, with the result that few errors have occurred. We should, however, be prepared for the emergency by establishing a suitable standard for each product and conduct such experiments as may be deemed necessary to see that such a standard is maintained.

The increasing use of biological products for the treatment and prevention of disease, confronts us with the possibility of the introduction of a serious contagious malady, consequently, all of these preparations should be subjected to the most rigid scrutiny before their use is allowed. This scrutiny should include, not only an examination of the finished product, but a careful inspection of the premises where they are manufactured, that the suitability of the plant may properly be passed upon. Such a course will prove an additional insurance of the live stock of the country against accidental losses from preventable contagious disease.

The passage of a bill along the lines of that forwarded to you for consideration in May last would meet the danger which is above indicated.

The details connected with our manufactured products are as follows:—

MALLEIN.

As formerly, this product has consumed more of our time than that of the others with whose manufacture we have been charged. In this connection it may be in order to state that the electrically heated incubator which we use for the manufacture of this product is giving satisfaction and requires no attention whatever to keep it in proper order at the requisite temperature.

The disbursements for the past five years have been as follows:—

	1907-08.	1808-09.	1909-10.	1910-11.	1911-12.
April.....	1,750	3,861	2,905	9,041	295
May.....	1,600	3,140	3,525	3,815	2,940
June.....	1,308	2,702	1,440	4,280	4,555
July.....	2,205	3,000	2,191	4,655	7,595
August.....	1,675	2,347	1,660	2,720	3,735
September.....	1,150	2,200	2,700	2,320	4,395
October.....	1,835	1,935	2,670	3,005	4,295
November.....	1,895	2,567	2,850	3,281	3,175
December.....	553	1,420	1,085	1,920	860
January.....	2,090	905	1,760	2,405	4,660
February.....	1,320	1,250	2,290	2,640	3,360
March.....	3,565	7,460	7,950	10,030	8,015
	20,946	32,815	32,996	50,112	47,880

During the year I have resumed some experimental work which I started some eight years ago, in the separation of the active principle in mallein. This work is incomplete and a report thereon must necessarily be deferred until more data is available.

• TUBERCULIN.

The disbursements of this product have shown an increase during the year. Special tuberculin has been disbursed in certain specific instances for the purpose of determining the value of methods of application other than the subcutaneous injection.

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tion. A new product has been prepared which I have named 'tub-dis' from the fact that it is a special tuberculin distillate and the experimental results with this product are so far satisfactory. Whether it will prove of any practical value can only be determined by further experimentation along lines which we are unable at present to consider.

The disbursements of tuberculin for the routine testing of cattle for the past five years have been as follows:

—	1907-08.	1908-09.	1909-10.	1910-11.	1911-12.
April.....	569	878	648	654	673
May.....	848	829	418	1,178	810
June.....	206	902	496	568	505
July.....	257	1,190	887	432	645
August.....	336	323	760	544	185
September.....	583	214	335	632	477
October.....	276	458	474	381	632
November.....	565	826	561	801	1,340
December.....	735	807	488	621	429
January.....	562	322	282	1,087	899
February.....	575	257	634	561	420
March.....	482	1,035	617	797	957
	5,934	8,061	6,600	8,256	7,963

BLACK-LEG VACCINE.

Black-leg Vaccine has continued to be prepared and disbursed during the year and the lack of complaints is evidence that it has given satisfaction. The vaccine package is giving satisfaction and is eminently suited for the putting up of this product. Our disbursements for the past five years have been as follows:—

—	1907-08.	1908-09.	1909-10.	1910-11.	1911-12.
April.....	250	2,815	1,330	843	2,076
May.....	392	1,177	1,114	2,013	826
June.....	554	601	1,714	2,846	463
July.....	392	572	1,007	678	416
August.....	254	350	310	427	1,023
September.....	585	734	899	569	1,328
October.....	998	260	300	4,094	1,019
November.....	785	218	788	1,801	568
December.....	1,560	410	389	345	463
January.....	..	35	136	147	55
February.....	270	4 0	4,761	380	188
March.....	990	902	739	3,101	1,085
	7,031	8,064	13,469	17,264	9,510

ANTHRAX VACCINE.

Anthrax Vaccine is still prepared and disbursed on silk threads which are held in a special clip attached to the cork of the container. This method of putting up the vaccine is the most suitable means for its presentation to those desiring to immunize animals and we found that put up in this manner it is efficient for six years in affording adequate protection against an experimentally inoculated virus. The disbursements of this vaccine have been larger than for any year since we have been engaged in its manufacture. It is particularly gratifying to know that this vaccine was used

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under the supervision of Dr. Evans in connection with an outbreak occurring in Alberta without any apparent reaction in the inoculated animals and that no further cases have occurred in the immunized animals, which include horses, sheep and cattle. The sheep during the period of observation while they were undergoing the process of vaccination gained considerably in weight.

Our disbursements for the past five years have been as follows:—

—	1907-08.	1908-09.	1909-10.	1910-11.	1911-12.
April.....	339	.....	.....	21	56
May.....	17	.....	38	70	60
June.....	.....	.....	112	.....	200
July.....	98	265	47	36	412
August.....	77	75	40	.....	40
September.....	5	10	62	.....	240
October.....	15	43	17	32	12
November.....	.....	.....	.....	.....	.....
December.....	32	25	.....	.....	.....
January.....	.....	10	.....	.....	6
February.....	.....	.....	.....	.....	330
March.....	.....	36	70	95	.....
	483	464	386	254	1,356

GLANDERS.

During the latter part of the year we have spent considerable time in familiarizing ourselves with the details of determining glanders by the method of complement fixation. At the outset this work was in the hands of Dr. Evans, but on his leaving for Lethbridge Dr. Reid assumed its details. This has proven a very interesting field of investigation, although it does not appear, at the present at least, that this will supersede the use of mallein in the field. There is a possibility of an error occurring with this method, as there is with any highly technical procedure, and this feature will require careful consideration before any statement can be made as to its suitability for general work. The details cannot, in our opinion, be conducted in any but a properly equipped laboratory and the individual supervising the actual conduct of the work, aside from being highly trained in this special procedure, must of necessity possess a natural aptitude for the work.

The further experimentation with the diagnosing of glanders by this method, coupled with the opportunity of performing careful autopsies, including bacteriological examinations on experimental cases, will place us in possession of much valuable data regarding its value and the same cases may also be used to determine the relative accuracy of this means of diagnosis as compared with the subcutaneous injection of mallein. If such work was undertaken other means of diagnosis such as the agglutination and precipitation methods would increase the ultimate value of the investigations and place us in the position of knowing, at least from the technical standpoint, the degree of error connected with the various measures proposed for the diagnosis of glanders.

HOG CHOLERA.

During the year we have conducted no investigation with this affection, but the continued prevalence of the disease suggests that a series of carefully conducted experiments may possibly enable us to determine the source of infection in obscure outbreaks. Such an investigation cannot fail to be of practical advantage, for a full knowledge of the dangerous sources through which the disease may be introduced will enable the application of more intelligent restrictive measures.

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The methods of diagnosis which we are now forced to make use of are not wholly satisfactory from the laboratory or practical standpoint. I anticipate that a study of some of the problems connected with this disease will enable us to perfect our technique and may also indicate a more satisfactory means of dealing with outbreaks.

It will be my endeavour to take up this work during the coming year, as the greater portion of the equipment required is now available for this purpose.

I am aware that some of the commercial houses engaged in the manufacture of biological products are endeavouring to produce a vaccine for effective prevention of this disease. Whether their efforts will result successfully is a question for the future to decide. The nature of the infectious agent is such that more difficulty must of necessity be experienced than has been the case with disorders caused by easily demonstrated organisms.

A feature connected with hog cholera seems, for the moment at least, to have been lost sight of, namely, the possibility of breeding a race which will prove more resistant to the ravages of the disease. The fact that there is a natural immunity exhibited by individuals in a herd suggests the possibility of success attending such efforts.

GELATINE, AND ITS EXAMINATION FOR ENTRY INTO APPROVED FOOD PRODUCTS PREPARED UNDER THE MEAT AND CANNED FOODS ACT.

During the year, we have examined a large number of gelatines designed for use in connection with jellied food products, prepared at various packing houses operating under the Meat and Canned Foods Act. It has been necessary to condemn a portion of the samples as unfit for entry into a food designed for human consumption owing to the presence of toxic products. The appearance of these gelatines has varied to such an extent that one cannot pre-determine the result before conducting an adequate physiological examination.

There is, further, no standard for the examination of such a food material. We have, however, laid down certain principles which we have followed in each case before finally deciding their suitability for entering human food. It is our opinion that an inquiry should be made into this question, dealing with the various steps in the manufacture and treatment of the crude materials, that we may fully understand the formation of the toxic substances (toxines, toxalbumens, ptomaines, &c.), and their possible danger to human health. Of the samples examined, the greater number have been of foreign manufacture and the various grades seem to be used by different manufacturers for entry into their special food preparations. Certain lines of the packing business seem to have a common source of supply. In one instance we approved of a sample which later proved too expensive for the manufacturer to use and in its stead a very inferior product was substituted. As this substitute failed to indicate evidence of the presence of toxic substances during our examination, no alternative was open for us other than to approve of its use. From this statement it is desirable that I record our method of examination, which is the standard that we have adopted for the determination of toxic materials (toxines, toxalbumens, ptomaines, &c.), in gelatines, or food products which they enter as a component part.

In adopting a standard, we have endeavoured to follow the general principles laid down by other observers for the detection of toxic substances, the result of bacterial growth. For this no very definite data is available as practically all of the work reported has been conducted for a different purpose than that of judging the suitability for human consumption of such a complex substance as commercial gelatine.

From the viewpoint of the inspection of uncooked meat products, we have three forms of poisoning in the human being recorded by Edelmänn. These are: (1) as a result of the *Bacillus enteritidis* (Gärtner); (2) as a result of the *Bacterium coli*, proteus species, &c., and (3) as a result of the *Botulismus bacillus*.

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In each instance the micro-organisms or the toxic substances, which may be formed during their growth, are the active inciting agents of severe illness and sometimes death, when taken with food by human beings. These bacteria can easily be detected when food material is in a fresh state, and, having the bacteria in pure culture, little difficulty is experienced in determining the cause of the trouble. With a sterilized product, such as gelatine, greater difficulty is encountered in determining the cause of a series of poisonings, as we are here unable to select the specific bacteria responsible for the formation of the toxic substances. To detect these substances chemically, is stated by eminent chemists to be practically impossible, owing to the ease with which they are broken up during the necessary chemical manipulation required for their extraction. To detect them by animal experimentation is, then, the only course left to us, and naturally the method by which this may be accomplished concerns us when we have to deal with the suitability of gelatine for human food.

We are conversant with Basenau's method of dealing with fresh meats, which method is primarily concerned with the bacteriological technique required for the identification of the bacteria involved in the process. We are also aware of his methods for the detection of poisonous substances in fresh meat which consists in the feeding of mice, and on the results of this feeding, basing a judgment as to its suitability for human consumption. Another test is also mentioned in the leading works on meat inspection to determine the presence of drugs and products of decomposition, called the '*boiling test*,' the judgment depending on the odour. When odours due to drugs, sexual abnormalities, offensive encapsulated abscesses, icterus (jaundice), parasitisms, &c., are detected, the meat is considered unfit for human consumption.

In dealing with the gelatines we have a somewhat similar proposition, but also are concerned with a finished product manufactured in an establishment at present not coming within the purview of the Meat and Canned Foods Act. We are also aware that substances may enter gelatine which would under no other condition be allowed entry into a product designed for human consumption prepared in an establishment under inspection. Being aware of this, it has been necessary for us to establish for our own guidance, some means which may be conducted as a standard procedure in our routine examinations. In this we have passed over the feeding tests as being unsuited to our requirements in the detection of minute quantities of toxic bacterial substances.

As Basenau has pointed out, the fatal effects of feeding mice must be taken as evidence of warranting the condemnation of fresh meat, this referring particularly to contamination with the bacillus enteritidis and allied forms of bacteria.

With other small animals we have considered the use of guinea-pigs and rabbits by feeding. As both of these animals are herbivorous we do not consider their digestive apparatus suited for this purpose. Dogs being carnivorous and exhibiting a marked partiality to putrid substances cannot be considered suitable. Hogs, while being like man, omnivorous, are too expensive for the purpose. We are also aware of instances where hogs have maintained bacteria in their intestines without ill effect, yet, the introduction of these bacteria, or, the sterile substances formed by the bacteria during their growth, into the alimentary tract of human beings resulted in serious illness. From this we consider them unsuitable for feeding experiments.

We also consider the '*boiling test*' of little practical value in the judging of gelatine, as this method is dependant upon the element of individual judgment which is a very variable factor. While we do not use these two methods for final judgment the latter is an important guide in our examinations.

With these preliminary remarks we now come to the detailed description of our standard. In this we have followed what has seemed to us the most rational means of examination, namely, that which is used in testing toxins known to be the result of bacterial growth. This consists in the addition of ten per cent of the gelatine to

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a sterile normal salt solution after the gelatine has been soaked until soft, and subsequently washed in a similar sterile solution. The soaking and washing is to remove any bacteria or toxic material which may have been adherent to the gelatine during its transportation or manipulation prior to receipt at the laboratory. The gelatine is weighed in its dry state before undergoing the above mentioned treatment, and it is on this weight that our estimation of the dosage is based. The ten per cent solution is then used for subcutaneous injection into guinea-pigs, (preferably those of 250 grammes in weight, these having been shown by various observers to be the most suitable in the routine testing of toxins), in gradually increasing doses from one cubic centimetre to ten cubic centimetres. The preparation of the guinea-pigs is that recommended by Rosenau and consists in the shaving and sterilization of the site of inoculation. It is thus seen that a very small amount of the gelatine under observation is used in an individual test, namely, from 0.1 to 1.0 gramme, which is equivalent to one and a half to fifteen grains of the original dried gelatine.

Ten guinea-pigs are used in each case, and, after the inoculation they are kept, in so far as it is practicable, in a manner as nearly identical as it is possible to secure, to that with which they have previously been accustomed. Each animal is tagged and an individual record is kept of the amount it has received and its subsequent condition. In the event of no symptoms and no deaths occurring in the five day period, the gelatine is passed as being suitable for entry into a human food product, provided, however, it is in other respects satisfactory. Where deaths occur an examination is made to determine whether these are the result of bacterial origin or due to toxic substances contained in the material under consideration.

In this manner we have tested, during the past two years and a half a total of fifty-seven samples, including gelatine and other food products. Thirteen of these have been condemned as being unfit for human food. Where we have had no illness or deaths as a result of the original gelatine we have had no illness or deaths as a result of the finished product.

We are aware that proteid substances may give a re-action when introduced under the skin of guinea-pigs but we have been unable to detect evidences which would lead us to conclude that the deaths in any of our cases were due to such proteid bodies. The fact that the animals do not die is not conclusive proof of the absence of toxic products, for in one of the cases coming under our observation, no deaths occurred, yet the experimental animals were ill. In this instance we had the history of sixteen persons in six families all of whom exhibited similar symptoms of distress, viz.: acute abdominal pain, violent vomiting and diarrhoea, followed by prostration. Our experiments in this instance were not only conducted with the product as eaten, but also with samples taken from the bulk in the possession of the retailer and a sample of gelatine secured from the Inspector in charge of the plant and under whose supervision the product was prepared. Our results indicated that the gelatine was directly responsible, in that we secured similar data from the gelatine as we had previously secured from both samples of the finished product.

WATER EXAMINATIONS.

Since October, 1910, we have been conducting periodical examination of the water supplied to the various government buildings and also the water after passing through special sterilizing machines. During the year just ended we have made three hundred and sixty-six bacteriological examinations of water from government buildings.

At the outset, the examinations were required by the Public Works Department from the supplies in the Central Parliament buildings after the installation of the sterilizing machines. Our supervision of the water after treatment resulted in an improvement in this supply, and has resulted in adopting certain routine procedures on the part of the men intrusted with the supervision of these machines which ensure

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the safety of this supply. On October 13, at the invitation of Mr. Shearer, Superintendent of Public Buildings for the Public Works Department, I was present in his office at a demonstration of an apparatus for sterilizing water by an ozonizing process. The apparatus did not work satisfactorily, and the water presented a higher bacterial count after passing through the machine than it did before entering it. Other difficulties occurred and as a result none of these machines have been installed in public buildings.

On October 25, sterilizing machines were in operation in the East Block, West Block, Langevin Block and the Harris & Campbell building. On January 2, that at the Canadian building was in operation, while on the 25th the equipment in the Woods building was completed.

The raw water has shown evidence of sewage contamination excepting at intervals. The degree of contamination has varied at different points, a feature which at times has been somewhat puzzling to account for.

The drinking water supply which is furnished by the sterilizing machines has never shown evidence of sewage contamination. A non-pathogenic spore-bearing organism has been found repeatedly, but this is harmless to small experimental animals and we, therefore, conclude that it is also harmless for human beings. On the whole I consider that the results secured by the installation of the sterilizing machines has been very satisfactory, and is an adequate safeguard in the prevention of water-borne disease.

I do not consider that the addition of details concerning our examinations of water would add materially to this report as the results are available for reference, by properly authorized individuals.

RABIES.

We are still called upon to determine the presence or absence of rabies in animals, material from which is forwarded to the laboratory for examination.

Formerly, we have not depended on the finding of the bodies described by Negri in the large pyramidal cells of Ammon's horn. We have, however, during the past three years, devoted a considerable amount of time to the detection of these bodies, and have subsequently had our findings checked by our animal inoculations which have been connected as a usual procedure. Our results have been, that when we found indisputable evidence of these bodies in the cells referred to, the inoculated animal, after a suitable period of observation, developed rabies and died. After the development of the disease the clinical picture has been characteristic. I refer in this to our work with rabbits as the experimental animals. Smaller animals, such as guinea-pigs, have not proven satisfactory for this work, and we do not attach much importance to any results which we may obtain with these animals.

Cases arise, however, where no Negri bodies are found, yet all of the experimental animals succumb to the disease. Why this is so we can offer no opinion. We do know that we are unable to demonstrate Negri bodies in undoubted cases of the disease which appear to be due to a virus with an enhanced virulence. This has been the experience of the majority of workers making a study of the microscopic diagnosis of this affection. It has also been our experience that by passing the virus through a series of animals, while the original material may have shown the bodies in relatively large forms and very distinct, as we progress in the serial inoculations the bodies become smaller and less distinct, there appearing to be some direct relationship between their size and virulence, the smaller bodies indicating an increased strength to the virus.

While we are of the opinion that the presence of the bodies indicates the existence of rabies in at least 98 per cent of the cases, it does not necessarily follow that their absence is proof of the absence of rabies. While this is the result with regard to the

Negri bodies, I may state that all of our inoculations with material from proved cases of rabies have not been of unequalled success in producing death with characteristic symptoms. We have observed instances where two out of three rabbits have died with unmistakable symptoms in from fifteen to thirty-five days, yet, another inoculated with the same material at the same time and under as nearly identical conditions as it is possible to secure, remained alive and well after a period of observation extending over six months. This is our reason for using three rabbits where animal inoculations alone have been depended upon.

From our experience, as above outlined, it is apparent that neither method is free from a possible source of error. The error cannot be wholly eliminated, although care does reduce it to the minimum.

We are now dealing with the diagnosis of rabies on the following lines:—On the receipt of suspected material, a microscopic examination is immediately made in every case. Where we secure positive findings of Negri bodies from such an examination, one rabbit is inoculated for the purpose of checking this finding. Where our finding is negative and the history does not clearly indicate rabies, we issue a negative report and preserve material for animal inoculations should such be desired. Where the history is indicative of rabies and our finding is negative, we report the negative finding and inoculate three rabbits forthwith.

Much anxiety can be avoided if those who come in contact with a suspected case of rabies act intelligently. *Where rabies is suspected the animal should not be killed if this can possibly be avoided, but should be secured alive and held where it can do no harm...* If the animal has rabies, unmistakable symptoms will develop within forty-eight hours and the animal will usually be dead within five days. Many instances have come to our notice where a dog has been caught and securely confined to be subsequently shot or clubbed to death before a diagnosis could be established. Had such an animal been kept alive, needless worry would have been avoided and in the events of rabies having developed in the animal, the prompt administration of the Pasteur treatment would have been less painful. In some cases the necessity for treatment would have been avoided by such a procedure.

TUBERCULOSIS.

Our work with tuberculosis during the past year has not been extensive, although some of our results are of considerable scientific and practical interest. Probably the work which we have done in an effort to determine the value of a treatment for pulmonary tuberculosis of the human, reported by Dr. Thomas Dewar (*) of Dunblane, Scotland, will prove of great interest to the readers of this report. These experiments can only be considered as being of a preliminary character, and I hope that opportunity will be afforded us to secure further data at some not far distant date. His method of treating human beings is to give properly graduated intravenous injections of iodoform dissolved in ether, to which has been added an equal amount of liquid paraffine. As to the results following such an injection and the manner in which a beneficial action is produced, I can do no better than present Dr. Dewar's own statement as presented to the Glasgow Medico-chirurgical Society on the 3rd of February, 1911, which are as follows:

"How, then, does the iodoform act? The dose is so small and the poison it has to counteract so virulent that it is permissible to indulge in a little speculation.

(*) Thos. W. Dewar, M.D., F.R.C.P., F.R.S.E., Dunblane, N.B. 'Preliminary Report on the Treatment of Advanced Pulmonary Tuberculosis by Intravenous Injections of Iodoform.' Brit. Med. Jour., Nov. 21, 1903.

Same Author. 'Further Report on the Treatment of Phthisis by Iodoform Infusion.' Brit. Med. Jour., Jan. 14, 1905.

Same Author. 'The Treatment of Phthisis by means of Intravenous Injection of an Ethereal Solution of Iodoform.' Glasgow Medical Journal, July, 1911.

Also, John Bain, M.B., C.M. Glasg., 'The Treatment of Phthisis by the Intravenous Injection of Iodoform.' (Dr. Dewar's method) Glasgow Medical Journal, May, 1909.

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1. It may act in a germicidal character as its own molecule. It has long enjoyed the confidence of our profession as the best antiseptic in tuberculous disease.

2. If this directly destructive effect is not likely, may it not excite the micro- and macrophages of Metchnikoff, aiding their phagocytosis at the point where the defence is crumbling. If CHI_3 is weak germicidally, it is also comparatively harmless to living cells. It may even be beneficial to and absorbable by them, thereby conferring an increased vitality and fighting power.

3. There is a possibility that the CHI_3 undergoes decomposition, resulting in the production of bodies in themselves more powerfully destructive to germs. While CHI_3 in powder is very stable and unaffected by light, when in ethereal solution it is easily oxidized by the oxygen of the air when the solution is exposed to sunlight.

The first change on oxidation is probably the formation of a transition body, CHIO , brought about by the CHI_3 molecule, having two of its atoms of iodine substituted by one of oxygen. If this transition body now parts with its atom of iodine and takes up the hydrogen we have nascent formic aldehyde (CH_2O) made *in situ*.

Here then we would have a germicide of enormous power with all the increased energy of nascent formation. But there is still a valuable asset in the circulation, a powerful germicide and chemically remarkable, viz., the liberated nascent free iodine. The peculiarity of iodine in the chemistry of organic iodo-substitution bodies is well known. They are unique as compared with the chlorine and bromine substitution bodies, because when treated with HI , free iodine is liberated and H takes the place of I , thus regenerating the normal H body. We have now the free I , capable of producing new organic iodo-substitution compounds with other bodies from which it can be liberated again by a similar cycle of operations, so that the I is alternately combined and free. In this way we have got a chemical mechanism in which the I is used over and over again. For the discovery of this remarkable behaviour of iodine we are indebted to the late Professor Kekulie. It is almost analogous to an enzyme, and helps to explain or account for the power iodoform seems to have in this disease.

Now, while these observations of Professor Kekulie are chemical facts, it may not be in this way that it acts at all. It is quite possible that the whole action resembles serum therapy. In other words the iodoform may act as a toxin, inducing the formation in the blood and tissues of an antitoxin to the CHI_3 , and it may possibly be this anti-iodoform toxin which is inimical to the growth of the tubercle bacilli, and destructive to its toxins; or to put it in another way, by the use of CHI_3 we may produce true opsonisation. However the results are to be explained, it seems to assist patients in their recovery.

In the meantime, until something more powerful and easier of application is introduced, we know exactly what we are using, and that it is generally antidotal in its properties. For in this disease we must not forget that, in addition to the complex and still undefined toxins of the tubercle bacillus, we have in mixed infections to neutralize the toxins of a variety of other germs, differing in each particular case, as well as the poisons derived from cell disintegration due to necrosis (Cook's case). It is a treatment which can be applied without risk to all types and all stages of the disease. If the patient is hopeless, it will diminish his malaise during the day, relieve his cough at night, and so secure him sleep. Now the doses which I use vary from $\frac{1}{4}$ to 1 grain, and are generally administered three times a week. But the intelligent physician must use his judgment and not overdose."

In some of Dr. Dewars' cases reports are given which indicate that under ordinary conditions they would have been unable to perform their ordinary work, but under his care they were not compelled to give up entirely; they have gained in weight and subsequently made an almost complete recovery.

After careful perusal of his data we were somewhat skeptical of the results and undertook on a very limited scale the treatment of rabbits which had been given intra-

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tracheal injections of a virulent bovine organism. Our results may be considered as partially successful as the clinical symptoms gradually became less noticeable and the rabbits increased in weight. In one case on which an autopsy was performed to determine the progress of the treatment and the nature of the lesions, we found on microscopical examination that the alveolar walls of the lungs showed a thickening, there were foci in which consolidation had taken place, yet we were unable to demonstrate giant cells or bacilli. Shortly after the inception of the treatment we were satisfied that under ordinary conditions this animal would have succumbed, as it had continually lost in weight subsequent to the intra-tracheal injection of bacilli and continued to lose in weight for the first eight days after the inception of the intravenous iodoform treatment. A slight improvement and concurrent gain in weight from twenty-five to forty grammes per day was observed after this period until the time of his destruction for purposes of autopsy.

The treatment consisted in the intravenous injection (in the ear vein) of two drops (the equivalent of one-sixtieth of a grain of iodoform) of the following solution:—

Iodoform, 1 grain.

Ether

Liquid paraffine *aa* 60 minims.

The solution was freshly made immediately prior to each injection and should be held in an amber coloured syringe on account of the combined action of the light in the presence of the oxygen of the air causing a change in the composition of the iodoform.

Another series of rabbits was similarly injected with tuberculosis by the intra-tracheal method and the treatment with iodoform instituted with three on the twelfth day thereafter. Our results in this instance, however, were not wholly satisfactory, as the first check animal died on the sixteenth day of a generalized tuberculosis, indicating an organism of much higher virulence than we anticipated at the outset. We later confirmed by other experiments conducted in our routine examinations of strains of recently isolated tubercle bacilli that this organism was one of a very virulent type. In this series, however, the treated animals presented a slight gain in weight after the fifth day of treatment and maintained this gain until death took place from a generalized infection. The treatment was too long delayed, thus allowing the disease to secure a greater foothold than was desired for our experiments.

Further experiments with this method of treatment are anticipated and our method will include the inception of the treatment at the time of inoculation in a number of the experimental animals, while in others of the series the treatment will be commenced at stated intervals to determine the relative value of this means in dealing with experimental tuberculosis. It would also be very interesting and might possibly be of value to conduct a similar experiment, using cattle as the experimental animals. Valuable data would be forthcoming from such an experiment that would be of practical benefit.

A very interesting case came to our notice through the Meat Inspection Division in the viscera of a calf forwarded for diagnosis by Inspector Fisher. This calf was but three weeks old and showed the lesions of a generalized tuberculosis involving the liver, spleen, lungs and lymphatic system. A feature of the microscopic examination of the lesions was the large size of the giant cells and their relative frequency in the affected tissues. This case must have been congenital as the lesions were too far advanced to have been formed after its birth.

Another case of tuberculosis of more than ordinary interest was forwarded by Inspector Kellam comprising portions of the viscera of a fat steer. The lesions in this instance were not typical in their naked eye appearance nor was it a particularly easy matter to verify the diagnosis microscopically. We, however, were able to find typical evidence and after a very careful search of numerous smear preparations from affected tissues, found a number of bacilli.

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TUBERCULOSIS IN POULTRY.

We have still continued to examine fowls and in this have found a great many affected with tuberculosis. This disease in poultry is very prevalent, if the number of cases which we have received can be considered to bear a direct relationship to its existence. Recently, (November 1911), the Ontario Agricultural College published a Bulletin, No. 193, by S. F. Edwards, M.S., their information relative to its occurrence in Ontario. This bulletin records forty-three outbreaks. Since we commenced to encounter this affection in fowls we have received material from fifty-three outbreaks in Ontario. We have, however, records of the presence of this disease among fowl in various portions of the country indicating that this affection alone is responsible for serious losses to raisers of poultry. In one instance an individual fowl which at our autopsy was found to be tuberculous, was reported to have been valued at over five hundred dollars. It is therefore apparent that the monetary loss in this instance was considerable.

Owing to the many inquiries relative to tuberculosis in poultry it was deemed advisable to prepare a short article or circular (Circular No. 2), on the subject, which is as follows:—

Circular No. 2.

DOMINION OF CANADA.

DEPARTMENT OF AGRICULTURE—HEALTH OF ANIMALS BRANCH.

BIOLOGICAL LABORATORY.

TUBERCULOSIS IN POULTRY.

BY

C. H. HIGGINS, B.S., D.V.S., *Pathologist.*

Tuberculosis or consumption is a disease that affects fowl as well as the human being, cattle, hogs and other animals. It is caused by a bacillus or germ which is only distinguishable from the germ seen in other animals by elaborate laboratory methods. This affection among fowl was first identified in Western Ontario by Prof. F. C. Harrison in 1901, Prof. F. C. Elford in 1903, and by the writer, in fowls received at the laboratory on May 30, 1904, from British Columbia for an examination to determine the cause of death. Since 1904 the disease has been found by us to be the cause of losses to poultry owners in various parts of British Columbia and also in Quebec, Ontario, Saskatchewan and Alberta. It may be and probably is the cause of losses in other provinces. The disease has also been frequently reported from the Bacteriological Laboratory of the Guelph Agricultural College.

LOSSES.

The losses from this disease have been large to poultry owners, but there is at present no means of arriving, even approximately, at an estimate with any degree of accuracy. Once the disease makes its appearance in a flock the aggregate losses are large although a great number of birds do not usually die at one time.

The following which is an extract from an inquiry made by a large poultry plant when sending an affected bird for examination, is quite the usual experience where tuberculosis makes its appearance in a flock.

‘We have lost as many as a hundred fowls with this disease during the past two years. They go light and gradually grow weaker, having a yellow or greenish diarrhoea, some eat to the last, others do not. We have fed mixed grains also

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mash, but they have been eating a large quantity of wheat screenings. We find many of our chicks go the same as the older hens, dying at all ages. We are beginning to think that artificial hatching has something to do with it and we are afraid it is tuberculosis caused by the overheated air of the incubator during the hatching season. We try to keep the conditions favourable around the houses and yards.'

In commenting on the above it is only necessary to state that tuberculosis, being due to a definite infecting germ, the overheating of the incubator or other conditions surrounding the chicks or fowl will not induce the disease unless the infecting germ is present. The surrounding conditions may render the fowl more susceptible, but cannot produce the disease.

NATURE OF THE DISEASE.

Tuberculosis or consumption in fowls as in other animals is a contagious disease caused by a bacillus or germ. This germ gains entrance to the system, usually with the food, and finding a favourable location grows and extends to the various tissues. This growth of the germ induces symptoms of unthriftiness and this unthriftiness is followed sooner or later by death. The detection of tuberculosis from the symptoms is not always easy. Some may be observed to be "going light," yet they are seen to be good feeders. If picked up it is found that the flesh has almost entirely disappeared from the breast bone and this should make one suspicious that something is wrong. A yellow or greenish diarrhoea is frequently present in affected birds, and where this is present the type of the disease is most dangerous to the remainder of the flock, as the germs are to be found in the droppings in immense numbers. One of the most frequent symptoms seen early in the course of the disease is lameness, a result of the infection involving a joint of the leg. Lameness is mentioned by persons forwarding fowls for diagnosis more frequently than any other symptom where our subsequent examinations have proven the trouble to be due to tuberculosis. So frequently is lameness the principal symptom observed that I am at once suspicious of tuberculosis whenever it is mentioned.

COURSE OF THE DISEASE.

Fowl affected with tuberculosis may die in a few days from the first appearance of symptoms or they may linger for weeks, gradually becoming more emaciated as the disease progresses, until they die from exhaustion. The progress is largely dependent on the strength of the invading germ and the natural resistance of the bird. Some outbreaks of the disease follow a more rapid course than others, usually, however, the course in an individual extends over weeks and sometimes months may intervene before death takes place.

POST MORTEM FINDINGS.

The post mortem findings in fowl tuberculosis, when considered in relation to the symptoms and general history, are characteristic. The liver is usually the principal organ affected and there are lesions, from the size of a pin point to that of a large pea, which are white or yellow in colour. The larger lesions when cut into give a gritty sensation as the knife passes through them. These lesions are distinct from the liver tissues and may be quite easily separated from the liver itself. In the more acute cases the liver may be greatly enlarged even to twice its normal size. This enlargement in chronic cases is noticeable. The spleen is usually involved, the lesions having the same characters as mentioned for those in the liver. The enlargement of the spleen is usual and it may be four times its normal size. The intestines may or may not be involved. When lesions are present we find nodules from the size of a small pea to that of a medium sized nut. The minute dissection of these usually presents a free opening into the inside of the bowel and at this point

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of entrance there is an ulceration. It is through this opening from the nodule on the intestine to the interior of the bowel that the bacilli gain access to and are so easily distributed by the droppings.

Other visceral organs are seldom involved. It is frequently observed that the joints, notably that of either or both hips, may be the seat of tubercular ulcerations. Such an ulceration is the cause of lameness during life.

PREVENTION AND TREATMENT.

In the prevention of tuberculosis and other infectious diseases of fowl, sanitary surroundings with plenty of sunlight and fresh air are requisites of prime importance. In our opinion these features are best obtained by use of the modern cotton front house, a number of types having been described by various poultry authorities. Circular No. 7, prepared by Prof. A. G. Gilbert of the Experimental Farm staff, describes in detail the method of construction and may be obtained on application.

The best means of preventing and treating tuberculosis in fowls is to destroy the entire flock if all have been running together, and to thoroughly cleanse and disinfect the quarters which they have occupied with any good disinfectant, one of which is a five per cent solution of crude carbolic acid. This may be made by adding two teacupfuls of crude carbolic acid to a pail of hot lime wash. This should be applied with a spray pump, brush or old broom to all parts of the house occupied by the fowl. This method of disinfection is suggested, owing to the fact that in tuberculosis or consumption in fowls, as has already been indicated, the bacilli or germs are found in the droppings in great numbers and these should be destroyed. This action is further recommended as it has been shown that fowls dead of tuberculosis if eaten by hogs communicate the disease to them and it is probable that the droppings would also communicate the disease in a similar manner.

When destroying the birds after it has been demonstrated that tuberculosis is present, some may be suitable for food if an examination of the livers shows no yellow or white spots from the size of a pin point to that of a pea, and there are no nodules or lumps on the intestines. When these lesions are present the flesh cannot be considered suitable for human food.

We have found that eggs from tuberculosis fowls may contain the bacilli or germs in the white, and have also demonstrated that they are in sufficient numbers to infect small experimental animals. This suggests a possible source through which tuberculosis may be introduced into a flock, namely by the unsuspecting purchase of eggs from some one who has tuberculosis among his fowl.

The drastic measures above recommended should be followed in all cases when tuberculosis appears among fowl. These measures while temporarily entailing a considerable loss will in the end prove the most economical to the owner and the community.

INSTRUCTIONS FOR SENDING MATERIAL FOR EXAMINATION.

Where it is desired to determine the nature of any condition causing losses among fowl, an examination will be undertaken by the biological laboratory, Ottawa providing suitable material is supplied. If possible, two live but affected birds should be forwarded by express in order that a thorough autopsy may be made. It is not necessary to prepay the express. When the condition has been found at autopsy the diseased tissues may be sent by mail, if properly packed and preserved. Tissues may be preserved in pure alcohol or a solution of one part of formaldehyde to nine parts of water. After an examination has been made suggestions will be forwarded for the prevention of further losses.

Specimens sent by express or mail should be addressed to the Biological Laboratory, Ottawa, Canada.

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Information concerning the losses which have been experienced should be sent with the material in order that it may be properly identified. The name and address of the sender should be written plainly so that the result of the examination may be forwarded with the least possible delay.

November 6, 1911."

TUBERCLE BACILLI IN THE EGGS OF TUBERCULOUS FOWL.

Some experimental work has been conducted with tuberculosis in poultry, the most important of which has been in connection with the danger of conveying the infection through eggs. Fifteen eggs were received from a flock of fowl in which the disease had been previously diagnosed as tuberculosis, the result of an autopsy performed at the laboratory to determine the cause of unthriftiness. Six of these eggs were used for microscopic examination and in three of them tubercle bacilli were demonstrated without difficulty. Eleven guinea-pigs were inoculated with material from ten of the eggs (one only of the series used for microscopic examination is included in the inoculation experiments), with the result that in two of these animals unmistakable evidence of tuberculosis was found, after allowing a suitable incubation period to elapse. This supplies us with incontrovertible evidence that under proper conditions the bacilli of avian tuberculosis can be transmitted to guinea-pigs by the subcutaneous inoculation of eggs from infected fowl. The danger to other animals has not been determined and there are also many practical points with reference to the transmission of this disease, one of the most important of which is, the possibility of conveying the disease to the young chicks during their incubation through the medium of the bacilli contained within the egg. We are preparing to secure evidence in this connection. A curious feature in connection with the presence of the bacilli in the egg is, that they are most easily found in close association with the gerin.

TRANSMISSION OF TUBERCULOSIS FROM BIRDS TO MAN.

As a recorded instance of the danger of transmission of tuberculosis by birds to the human being, the following extract from a lecture by Dr. H. Roger*, professor of comparative pathology of the Faculty of Medicine, Paris, is very significant.

'Animals that live in close promiscuity with man frequently contract tuberculosis, and may transmit it. By opposition to the belief of times gone by, the dog is often suffering with it. It may localize itself in the kidney, giving rise to lesions of softening and throwing in the urine considerable quantities of bacilli. Again see the danger of the propagation, which is so much greater that canine tuberculosis is easily overlooked. It is often manifested by productions of neoplastic appearance which resemble more those of cancer than of tuberculosis.

These home pet animals are yet more dangerous. Those among you who have been in my laboratory have seen a parrot, now dead, which had cutaneous tuberculosis. As is commonly the case, this bird had been infected by her owner, who had advanced tuberculosis, and the bacilli of human origin had invaded the skin of the head of the bird and promoted the growth of the warty lesions. In cases of this kind the animal, annoyed by these growths, scratches itself as it can; scabs of the skin get loose. These are particularly rich in virulent bacilli. Their dissemination spread the disease, and the infection is so much more dangerous when passing from the parrot; the pathogenous agent seems to have gained more infectious power. What is the end of the history of this bird? The first owner died. By his will the parrot went to a young woman healthy and strong. After a few months she began to cough, to lose flesh. Affected with acute

* Am. Vet. Rev. Vol. 41-P. 2 European Chronicles.

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tuberculosis she died in less than a year. No one around her had suspected the cause or origin of her disease. Her physician had never suspected it. Having become too homely, no one wanted the bird any more, and he was sent to my laboratory, where, for those who have seen his lesions, a diagnosis will remain evident and easily confirmed by bacteriologic examination.'

ENTERO-HEPATITIS OR BLACK-HEAD IN TURKEYS.

An increasing number of queries are being received concerning this affection in turkeys, and from these queries and the increasing price of this very valuable food animal it is evident that the ravages of this disease or some other equally potent factor has almost annihilated the turkey industry in certain sections of Canada. We have offered what assistance we could, but, unfortunately, have been able to do very little to prevent the appalling losses. In order that the information which we have gained during an experience of ten years may be available a circular has been prepared (Circular No. 1), to meet the questions propounded in the many inquiries which we have received. This circular also includes what we at present consider to be the best means of treating affected birds, namely, by the administration of properly diluted muriatic acid. In some instances from the reports which have come to our notice, where this treatment has been used, the results have been remarkable.

It has occurred to me that possibly the value of this treatment may be increased by the concurrent use of a properly prepared bacterial vaccine designed to reduce the number of bacteria in the intestine. Certain favourable results have been reported to me by a prominent veterinary surgeon who used the acid in conjunction with one of the commercial bacterial vaccines. I believe that the use of a specific vaccine would be followed by much more favourable results and purpose undertaking some experimental work in this connection during the coming year. I also desire to supplement the data which we have already secured, a summary of which is herewith presented.

Our experimental birds, five in number, were very ill on their receipt (October, 1910) and it was a question whether they would survive from one day to the next. They were immediately given the muriatic acid in the proportions recommended in the circular printed below. In a week there was some improvement noted and in three weeks we considered that they had made a full recovery. To determine whether the lesions which we assumed as being present from the aggravated symptoms which they presented on arrival, one was autopsied with the result that the liver was perfectly normal and the caeca showed but two small erosions which under ordinary circumstances would have passed unnoticed. We did not consider that this bird was affected at the time it was autopsied.

In the spring of 1911, two of the turkey hens were set on their eggs and hatched fifteen poults. These were allowed to range with the older birds with the result that aside from the deaths due to accidents, there were no deaths until August. Of the fifteen poults, ten died from accidental causes and five died of entero-hepatitis. Of those dying of entero-hepatitis, one was carried over the first attack by the muriatic acid treatment, two were carried over two attacks, and the other two carried over the third and fourth attacks. The acid was not continuously before them as it was desired to determine its value in carrying affected birds over the acute attack. We consider that it is fairly successful for such a purpose but not infallible. It may be of advantage to give the acid forcibly once or twice a day in order that the requisite dose may be introduced into the digestive track.

In September a very interesting fact was observed through the accidental death of one of the old turkey hens as a result of eating poisonous material thrown out with the laboratory refuse. At the autopsy on this bird it was found that while the liver presented no lesions of entero-hepatitis, there was a large core in one of the

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caeca. As this bird had shown no evidence of illness since it had recovered from the first attack, we have assumed that it was a chronic carrier of the infective agent. From this assumption we believe that a bird once affected may overcome the infection but is yet a menace to the flock on account of its being a chronic carrier and disseminator of the infective agent.

We hope to supplement the data above recorded during the coming season as provision is being made for a more comprehensive study of some of the problems with which we have been confronted during the past year.

The circular on entero-hepatitis above referred to is as follows:—

Circular No. 1.

DOMINION OF CANADA.

DEPARTMENT OF AGRICULTURE—HEALTH OF ANIMALS BRANCH.

BIOLOGICAL LABORATORY.

BLACK-HEAD IN TURKEYS.

(Entero-Hepatitis.)

BY

C. H. HIGGINS, B.S., D.V.S., Pathologist.

Entero-hepatitis or black-head in turkeys is a disease of fowl, infectious in its nature, usually seen in its most aggravated and fatal form among turkeys. Other fowl may be subject to the disease but losses among them are small compared with the loss among turkeys. The first investigations as to the nature and cause of the malady were made by Dr. Theobald Smith in Rhode Island, under the joint auspices of the United States Department of Agriculture and the Rhode Island Agricultural Experiment Station during 1894 and 1895. Various investigators have since taken up the study of the disease as it has become more widely distributed and a distinct menace to the turkey raising industry. Detailed information relative to the manner in which the disease is transmitted from an affected to a healthy bird is lacking. It is believed that this infection is direct from the droppings or from the ground on which they have been deposited. There is still some difference of opinion as to the exact organism responsible for the lesions produced but it is generally conceded to be a minute protozoan parasite. We anticipate conducting experiments and hope to be able to arrive at some definite conclusions regarding these and other unsettled points.

LOSSES.

The losses from this disease have been enormous and I believe that it is a factor responsible for the high price of turkeys. The extent of these losses is well indicated from the fact that two decades ago a single small island (Block island) off the Rhode Island coast provided two tons of marketable birds each year, while to-day but five hundred pounds are available from the same locality. Statements are also current that in localities in Ontario where ten carloads of birds were available eight years ago it is now difficult to secure two carloads. The reason to be ascribed for this falling off in production is the difficulty of rearing stock that can withstand this affection.

In Canada the disease was first mentioned by Gilbert in the Experimental Farms Report for 1900. It has since been repeatedly reported upon evidence obtained at this laboratory and at the Bacteriological Laboratory of the Guelph Agricultural

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College. From the information which we have obtained through communications received at this laboratory, it is evident that there is not a province in Canada where entero-hepatitis does not make its presence felt with more or less severity each season. In some portions of the country the disease has made such inroads on the turkey industry as to almost prohibit the raising of this class of fowl.

The usual history concerning losses is that an individual having a few fowl desires to supplement his poultry operations by raising a few turkeys. He is an unsuspecting buyer of parent stock or sittings of eggs until experience has made him painfully aware of the fact that he has bought with the birds or eggs the infective agent of this disease which later separates him from his original investment and the time he has spent in caring for the young poults. The season is then too late for him to attempt another start, his premises are infected, and, discouraged at the result, he decides to relinquish further effort in this direction. It is quite common where entero-hepatitis makes its appearance to lose seventy per cent of the young stock before they are sufficiently mature for table purposes.

NATURE OF THE DISEASE.

The early symptoms presented by affected birds are not particularly characteristic. Affected birds, however, will separate from the remainder of the flock. This separation or lagging behind does not appear to be a desire for seclusion but the result of being unequal to the task of keeping up with the others from physical exhaustion. The droppings are more fluid than normal and may be streaked with yellow. Gas bubbles may be sufficiently numerous to give a frothy appearance. The head may be and usually is darker in colour than normal. This dark colouration may disappear and reappear at irregular intervals while the bird is at rest, but excitement usually causes a bright red colouration.

The best means of early diagnosis is the examination of the droppings for evidence of diarrhoea or a yellow colouration of the faeces. Feeding time may prove the most appropriate for such observation. Where this is not convenient owners should provide some means of determining an infection at the earliest possible moment.

COURSE OF THE DISEASE.

Affected birds if untreated may die in a few days or may linger for a week or longer after the first appearance of symptoms according to the virulence of the infecting agent. In some cases the onset is so rapid and free from outward manifestations as to be recognizable only by an autopsy. Without treatment or a complete change in diet and surroundings, the course is usually fatal.

POST MORTEM FINDINGS.

The post mortem findings are characteristic. The lesions are confined to the liver and intestinal tract. The liver is the seat of lesions which appear on the surface as circular spots about the size of a five or ten cent piece, yellow or whitish yellow in colour and surrounded by what to the naked eye appears to be normal liver tissue. At the point between the lesions and the liver tissue, a ring almost bright red in colour is observed. These lesions in the liver if cut open may have a uniform colour throughout or in the more chronic cases there may be a core in the centre. The intestines may be the seat of a chronic inflammation. The caeca or two blind guts which lie along the course of the intestine and enter it about six inches from the vent are usually inflamed and in either or both a single or a number of lesions the size of a walnut are usually present. These lesions are yellow in colour, have a thick wall and a degenerated centre. There may be in addition to the above in severe, acute or chronic cases, either a localized or general peritonitis (inflammation of the outside wall of the intestines) with adhesions and fluid in the cavity.

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PREVENTION AND TREATMENT.

The placing of poults on clean, sanded board floors in a dry well lighted and well ventilated building with southern exposure, is considered a means of prevention. The continued contact with the floors, however, tends to weaken the poults. I believe it to be an advantage to see that they are quartered on sanded board floors at night and prevented from ranging in the early morning when the grass is wet. When the birds are older the roosting places should receive consideration. The free application of lime and sulphur wash (that used in spraying fruit trees is suitable) on the ground under the roosting places and the ground on which they are reared two or three times during the season, will destroy any infection on the ground. We believe that persons raising turkeys should be very careful not to introduce the disease when making additions to improve their stock. A turkey tom may be a source of infection when he heads the flock of a neighbourhood or the disease may be introduced with sittings of eggs. The greatest care should be exercised to prevent any possible source of infection reaching a flock or locality now free from disease.

The early diagnosis of the first case is an essential feature in connection with the prevention and treatment. As has already been indicated, it is the early diagnosis that will prove the most essential factor in successful prevention and treatment. The isolation of the first case may many times prevent further manifestations of the disease. From our experiments, however, it appears that there may be chronic carriers of the disease whose droppings are continually infected, notwithstanding the fact that they exhibit very slight if any symptoms. This suggests that isolation may not be as potent a factor in preventing losses as desired, but I believe that it should be enforced to such an extent as will prevent the old and young flocks intermingling after the first appearance of the disease.

Our experiments in the treatment of entero-hepatitis have been directed to the finding of some agent that will successfully carry affected birds over an acute attack and enable their being conditioned for market.

There is to my knowledge no known specific for controlling the ravages of this affection. The use of muriatic acid in the drinking water was found some six years ago to be followed by beneficial results on affected turkeys which I was trying to raise at my home. Later it was given a further trial and three years ago a single turkey at this laboratory made an apparent recovery. During the past two years we have recommended it as being the best medicinal agent which we know to assist in overcoming the affection. Last year five affected birds recovered after receiving liberal allowances of this acid. One of these which was later autopsied to determine the presence or absence of lesions, was found to be normal in every respect so far as we could determine.

Some apparently remarkable recoveries have followed the use of this acid, but one cannot hope to bring all affected birds through an attack. I was first prompted to use this acid as I found the contents of the digestive tract in turkeys dead of entero-hepatitis or black head to be alkaline in reaction.

The acid to be used is a teaspoonful of muriatic acid (Acid. Mur. Dil. B. P.) in a quart of drinking water. This acidulated water should be placed in a porcelain or glass vessel and is suggested in the hope that the birds may be carried over an acute attack. At the outset when the birds show evidence of being severely affected, it may be of advantage to triple the amount of acid (using three teaspoonfuls to the quart of water) for the first three days. This amount will not injure the turkeys and may assist them in more rapidly overcoming the infection.

They should be confined during this period on dry, sanded board floors in well lighted and well ventilated quarters and allowed access to no other liquid. If allowed to roam they may obtain sufficient water for their requirements from the dew laden grass or other sources and, therefore, will not drink the acidulated water. If confined, green food should be supplied in addition to the grain ration.

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Other medicinal agents may give equally satisfactory results in the treatment of affected birds as that above outlined, in which case my advice would be to stick to the remedy that has proven the most effective. If such other medicinal agents are effective we will appreciate learning of them. We will also appreciate information as to the success or otherwise of the treatment herein recommended.

INSTRUCTIONS FOR SENDING MATERIAL FOR EXAMINATION.

Where it is desired to determine the nature of any condition causing losses among turkeys, an examination will be undertaken provided suitable material is supplied. It is preferable to have affected turkeys forwarded alive by express in order that a thorough autopsy may be made. The express charges are paid by the Biological Laboratory. When the condition has been found at autopsy the tissues may be sent by mail if properly packed and preserved. Tissues may be preserved in pure alcohol or a solution of one part of formaldehyde to nine parts of water. After an examination has been made, suggestions will be forwarded for the prevention of further losses. Specimens sent should be addressed to the

Biological Laboratory, Ottawa, Canada.

Information concerning the losses which have been experienced should be sent with the material, in order that it may be properly identified. The name and address should be written plainly in order that the result of the examination may be forwarded to the sender with the least possible delay.

October 28, 1911."

In the foregoing I have outlined some of the more important phases of the work of this laboratory during the past year. In some instances it has been deemed advisable to include data from some of the investigations undertaken prior to the commencement of the current year, in order to present a full statement of our results.

I had hoped that it would be possible to include in this report some detailed drawings in colours illustrating features of our work and also photographs of gross and microscopic specimens which would have added greatly to its value. The necessary time for this work, however, has not been available.

In closing, I desire to thank the members of my staff for their loyal and painstaking efforts, and I anticipate that the year which we are about to enter will prove more fruitful than that just closing.

I have the honour to be, sir,

Your obedient servant,

CHAS. H. HIGGINS.

Pathologist.

The Veterinary Director General,
Ottawa, Ont.

APPENDIX No. 9.

S. HADWEN, D.V.S., FIRST ASST. PATHOLOGIST.

EXPERIMENTAL FARM,

AGASSIZ, B.C., March 31, 1912.

SIR,—I have the honour to forward my report for the year ending March 31, 1912.

The major part of my time has been taken up by the Red Water investigation at the Experimental Farm, Agassiz, B.C., and I am pleased to state that the barn for housing the experimental animals, and the laboratory are now in running order. The site for the laboratory, which was chosen by Mr. J. H. Grisdale, the Director of Experimental Farms, and Mr. P. H. Moore, the Superintendent of the farm, proves to be very suitable. I believe that the location of the laboratory, and the co-operation of these gentlemen, will help out the investigation very much.

My report this year on the Red Water is brief, the experiments are just under way, and none of them far enough advanced for publication.

My spare time, as heretofore, I have devoted to the study of ticks, and protozoology, I am incorporating some notes on the live history work I have been able to do, the most important being the life history of *Ix. angustus*, establishing the fact that the larva and nymph of this species possess an important character which is not present in the adult, this, I believe, is a rare occurrence among ticks.

During the year Dr. Watson and I published an article in Parasitology on Canadian Trypanasomes. In this article we each described three new species of trypanosome, one of which I have named in your honour, *Trypanasome rutherfordi*.

I made several long trips during the year. In August, I was requested to read a paper before the A.V.M.A. in Toronto, in which I described the work we are doing on *Haematuria*. The general consensus of opinion I gathered while there, was that the experiments were practical and likely to yield results. I also spent some time in Manitoba during September, and in December and January took a trip up to the north to look into a suspected disease among the goats there.

In conclusion, I wish to express my regret at your leaving the service, and to thank you for the last time officially, for the great interest you have always shown in experimental work, which I know was an honour, coming as it did, from one who had so many duties to attend to.

My thanks are also due to the farmers at Mount Lehman, B.C., where I was stationed, for their help in the work, and for their appreciation of your policy, which was evinced by their presenting me with a testimonial upon my departure, also to Mr. P. H. Moore, the Superintendent of the Experimental Farm at Agassiz, B.C., for his co-operation.

HAEMATURIA.

There is little to add to my previous articles on Haematuria. I have lately, however, come across a case where I found evidences of bleeding growths in the ureter, and in the pelvis of one kidney, this is the first case I have found in 22 consecutive post mortems. It is not astonishing that this should occur, but it is probably not a common occurrence.

A photograph was lately taken of the bladder from cow No. 58, the sub-mucous hemorrhages show very clearly, and I am including a coloured photograph of the same.

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A number of experiments have been started and it is to be hoped that these will be successful, but until they are completed there will be little to report.

SWAMP FEVER.

During the month of September, you instructed me to take a trip through the Riding Mountains in Manitoba, to endeavour to find out what was causing the heavy mortality among the horses there. Dr. McGilvray accompanied me, and we visited a number of farms together. I may say that had it not been for Dr. McGilvray's help, I should have been much at sea in diagnosing a number of different maladies affecting horses, which were all being classed as Swamp fever. We were unfortunate in not being able to come across any cases that were definitely affected with Swamp fever, but we came across a number of verminous anemias, and we came to the conclusion that many of these so called Swamp fever cases were in reality verminous ones. I secured a number of specimens of the *Sclerostomidae* of the three genera i.e., *Sclerostomum*, *Triodontophorus*, and *Cylichnostomum*. In all cases I found the aneurismal *Sclerostome* (*Sclerostomum vulgare*) which received confirmation by Dr. McGilvray finding two aneurisms.

In several cases, when a post mortem examination was being made, we found the fecal mass contained in the cœcum fairly moving with *Cylichnostomes*, these worms being very small, are apt to be overlooked, unless one is familiar with them. They are true blood suckers, and the walls of the gut showed plainly the damage which they and the other forms were doing.

THE LIFE HISTORY OF *IXODES ANGUSTUS* (BANKS).

(From proceedings B. C. Entomological Soc., 1911.)

This tick is found on a variety of animals, but in British Columbia occurs principally on squirrels (*Sciurus hudsonius douglasi* and *Sciurus hudsonius vancouverensis*).

The life history, as given below, is a result of a series of experiments made in summer and winter at room temperature. The time given of 221 days for the complete life cycle is probably very nearly what occurs in nature.* It would appear that the time required for *Ixodes angustus* to go through its life cycle is shorter than in many other varieties of Ixodes, as squirrels have nests, and it is in these that ecdysis occurs, the process being naturally hastened by the warmth of the animal.

The squirrels from which the ticks were taken, were shot at all times of the year and had about an equal number of ticks upon them. One point to note about squirrels is that they do not seem to wander far away from their abodes, and are often seen feeding day after day in the same spot; thus, any gorged ticks which dropped off them to moult would stand a good chance of getting on to the same animal again. Another interesting feature is the fact that males were seldom found together with the females on the squirrels, nearly 200 females and nymphs were captured before a single male was encountered. This means that copulation between the sexes occurs almost wholly in the squirrels' nests or on the ground.

The same general life history should apply also to the ticks found on other nesting animals, such as coons, and perhaps skunks, but to those which move about a great deal, like the mink and martens, I do not think it would apply, nor to bears, which den up after the cold weather has started and would no doubt go into their dens free from ticks.

*The complete life history of *Ix. vicinus* will in the majority of cases take one year and a half or two years.—(Wheeler.)

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Ixodes texanus (Banks) was found twice on coons (*Procyon lotor*) captured in hollow trees, both times in the dead of winter; one of them up north when the thermometer was much below zero. The exact temperature was not ascertained, but the trees round about were cracking with the frost.

These observations are further confirmed by the fact that no ticks have been found on the hares (generally known as rabbits) of the lower mainland in the winter, whereas in the summer ticks are almost invariably found on these animals.

Though ticks are able to withstand low temperatures without being killed, they become torpid when cold, and in my experiments, would not attach themselves to animals unless they had been previously warmed. Once they are firmly attached they are protected by the hair, and are, of course, kept warm by the animal's heat.

Ixodes angustus (Banks).

Gorged female—	Average of
Oviposition began at.	16 days
Larvae hatched at.	73 "
Larvae fed on rabbit—	
Average time of feeding.	2.5 "
Ecdysis, larvae issue as nymphs.	61 "
Nymphs fed on rabbit—	
Average time of feeding.	2.5 "
Ecdysis, nymphs issue as adults.	29 "
Adults attach and remain for.	7 "
Allowance for hardening of skin after ecdysis and time in waiting for host, ten days at each stage.	30 "
	221 "

Thus it is possible for *Ixodes angustus* to go through its various stages in seven months.

PLATE I.

Ixodes angustus ♂ venter surface.

PLATE II.

Ixodes angustus ♀.—Showing shape of capitulum and scutum.

PLATE III.

Ixodes angustus O.—The capitulum differs markedly from ♂ and ♀ at the base of the palpi two pointed processes are seen, and two auricular are seen laterally from the base.

PLATE IV.

Ixodes angustus L.—Exhibits the difference from ♂ and ♀, much the same as O.

NOTE.—For descriptions see Nuttall 1, Warburton, &c., (ticks, Part II.) For life history, see page 93 of this article.

NOTES ON TICKS.

TERMS AND SIGNS.

♂.	Male.
♀	Female.
O	Nymph.
L.	Larva.

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Ixodes angustus (Banks.)

1 ♀ gorged off <i>L. americanus</i> , Mount Lehman, B.C. . . .	21-6-'11
Oviposition began.	3-7-'11
Eggs hatched.	15-9-'11
L. placed on tame rabbit.	28-9-'11
L. came off tame rabbit, gorged.	14 on 2-10-'11
	23 on 4-10-'11
O. hatched.	2 on 2-12-'11
	1 on 6-12-'11
1 ♀ gorged off <i>L. americanus</i> , Mount Lehman, B.C. . . .	27-6-'11
Oviposition began.	9-7-'11
Eggs hatched.	20-9-'11
L placed on tame rabbit.	4-10-'11
L's came off tame rabbit, gorged—	
14 on.	5-10-'11
18 on.	6-10-'11
17 on. . . . .	.8 & 9-19-'11
O's hatched—	
8 on.	2-12-'11
3 on.	2-12-'11
5 on.	12-12-'11
3 O's gorged on tame rabbit, taken on <i>S. hudsonius douglasi</i> . . .	28-8-'10
Hatched between.	29-9-'10 and 21-11-'10
Adults which emerged, 1 ♂ and 2 ♀s.	
1 O gorged.	12-8-'10
Hatched between.	29-9-'10 and 21-11-'10
Adult emerged.	
O's gorged off <i>L. Americanus</i> , Mount Lehman, B.C.—	
1 gorged.21-6-'11	} Hatched.23-7-'11. 1♂ and 1♀
1 gorged.23-6-'11	
1 gorged.28-6-'11. Hatched.24-7-'11. 1♂	
1 gorged.28-6-'11. Hatched.25-7-'11. 1♂	
♀ gorged off <i>L. Americanus</i>	24-6-'11
Oviposition began.	5-7-'11
♀ gorged off <i>L. Americanus</i>	29-6-'11
Oviposition began.	22-7-'11
♀ gorged.	29-6-'11
Oviposition began.	22-7-'11
Hatching began.	24-9-'11
L. alive (Longevity).	18-4-'12

Notes on *Dermacentor albipictus* and *Dermacentor venustus*, illustrating the fact that the males remain on the host after the females have dropped off. These ticks were observed at Huntingdon, B.C., on April 19, 1911, on some horses imported from Washington, U.S.A.. on the above date it was just three weeks since they had left the pine scrub timber. These ticks all came off one horse, three of them were *Dermacentor venustus*, and the rest all *Dermacentor albipictus*. I was informed that all the horses were heavily infested with gorged ♀'s when they reached the boundary line, a few days before my visit.

TICKS COLLECTED.

- 4 ♂'s dead.
- 1 ♀ dead. (Ruptured.)
- 2 ♀'s alive. (1 semi-gorged.)
- 16 ♂'s alive.

Dermacentor albipictus.

Off horse, collected at Huntingdon, B.C., February 26, 1912. The horse came from Dolores, Colorado, U.S.A., and left there in October, 1911, coming by the road all the way.

20 ♀'s

19 ♂'s

26 O's.

1 O, which was white in colour, was split open, and an almost perfectly formed female found inside. Another O was also split open, and an immature adult found inside. A number of other O's showed signs of ecdysis. This proves that *Dermacentor albipictus* moults upon the host.

Dermacentor variabilis.

1 ♀ collected off cow, Aweme, Manitoba. 2-6-'10

Oviposition began. 18-6-'10

Eggs hatched. 14-8-10

A number were placed upon a rabbit, but none were recovered. Some were also placed on a chicken, they became extraordinarily active for a time, but soon left, and none appeared to take hold. All these of *D. variabilis* were collected by Mr. N. Criddle, of Treesbank, Manitoba.

1 ♀ collected off dog at Aweme, Manitoba. 19-6-'10

Oviposition began. 1 to 4-7-'10

Eggs hatched. 21-8-'10

Placed on tame rabbit. 26-8-'10

Between 27-8-'10 and 2-9-'10, 50 gorged larvæ were secured. On 7-12-'10 only 5 larvæ were found alive, none had moulted.

1 ♀ collected off dog at Aweme, Manitoba. 19-6-'10

Oviposition began, laid 2,339 eggs. 1 to 4-7-'10

Eggs hatched, 2,269 larvæ. 22-8-'10

L. alive (longevity). 19-1-'11

All dead. 26-1-'11

Collected off dog at Aweme, Manitoba. 25-5-'11

2 ♀'s oviposition started. 12-6-'11

Oviposition finished. 21-6-'11

♀'s died. 26-6-'11

Had not hatched up to. 2-11-'11

♀'s gorged off dog at Aweme, Manitoba. 25-6-'11

Oviposition began. 5-7-'11

Eggs hatched. 26-8-'11

All dead. 2-11-'11

1 ♀ gorged off dog at Aweme, Manitoba. 6-7-'11

Oviposition began. 16-7-'11

Eggs hatched. 26-8-'11

Put on rabbit, but did not attach (in cold room). 1-11-'11

1 ♀ gorged off dog at Aweme, Manitoba. 6-7-'11

Oviposition began. 16-7-'11

Eggs hatched. 26-8-'11

Put on rabbit. 10-2-'12

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L's came off gorged—

1 on.....	13-2-'12
73 on.....	14-2-'12
26 on.....	15-2-'12
20 on.....	16-2-'12

These ticks look as though they are going to moult. The cage and room, &c., in which the rabbit was put, were warmed before the ticks were put on. In my opinion my former failures were largely due to the animal being in too cold surroundings.

Haemaphysalis leporis palustris.

1 ♀ gorged off <i>L. americanus</i> , Aweme, Manitoba.....	13-5-'10
Oviposition began.....	1-6-'10
Eggs hatched.....	18-7-'10

Ticks were put on tame rabbit, but did not attach.

7 L's gorged off <i>L. americanus</i> , Mount Lehman, B.C....	10-8-'10
Hatched between.....	8-10-'10 and 5-5-'11

6 O's, 1 dead larvæ. (Four moulted skins secured.) These ticks were kept in a vial with a moist rag, the rag was quite dry when the vial was opened, and the ticks were all dead.

1 ♀ gorged off <i>L. americanus</i> , Peardonville, B.C....	17-5-'10
Oviposition began.....	25-5-'10
Eggs did not hatch.	

♀'s gorged off <i>L. americanus</i> , Aweme, Manitoba.....	17-7-'11
Oviposition began.....	23-7-'11
Eggs hatched.....	6-9-'11
Still alive.....	9-2-'12
Placed on tame rabbit.....	12-4-'12
L. came off tame rabbit gorged.....	10 on 17-4-'12
	44 on 18-4-'12
	17 on 19-4-'12
	36 on $\left. \begin{smallmatrix} 20 \\ 21 \end{smallmatrix} \right\}$ 4-'12

12 O's gorged off <i>L. americanus</i> , Aweme, Manitoba.....	17-7-'11
4 hatched.....	15-8-'11

32 O's collected off <i>L. americanus</i> , Aweme, Manitoba.....	17-7-'11
Placed on tame rabbit.....	24-7-'11
4 gorged.....	29-30-7-'11
2 hatched.....	21-9-'11
1 hatched.....	26-9-'11

All ticks from Aweme, Manitoba, were collected by Mr. N. Criddle.

LIST OF TICKS CAPTURED.

Genus Ixodes.

Ixodes angustus, Banks, Det. S. H.

Numerous specimens of ♂ ♀ O. L.

Hosts: *Scirius douglasi*, and *S. L. vancouverensis*, *Lepus americanus*, rats and mice.

Locality, Mount Lehman, B.C., and Duncans, Vancouver Island, B.C.

Ixodes texanus, Banks, Det. Nuttall.

4 ♀'s. 1 O, 1 L. off *Procyon lotor*.

Locality, Mount Lehman, B.C., 16-1-'10, and Bella Coola, 28-12. New to Canada.

Ixodes hexagonus, Leech, Det. Nuttall.

1 ♀, off weasel.

Locality, Mount Lehman, B.C., 27-1-'11. New to Canada.

Ixodes pratti, Banks, Det. S. H.

2 ♀'s off dog and cat.

Locality, Milk River, Alta., July, 1911. (Coll. Dr. A. Watson). New to Canada.

Ixodes ricinus, L. Det. S. H.

2 ♀'s off dog and man's arm.

Locality, Maple Bay, B.C., 25-12-'10, and Shawnigan Lake, 11-11-'10. (E. M. Anderson, coll.)

Two other species of *Ixodes* have been captured, of which the identity is at present undecided.

Genus Haemaphysalis.

Haemaphysalis punctata. C. and F. Det. Nuttall.

Numerous specimens of ♂ and ♀'s.

Locality, Manitoba. Coll. by Dr. J. D. Ross on many occasions.

Haemaphysalis leporis palustris. Packard, Det. S. H.

Numerous specimens of ♂, ♀, O. L.

Locality, Aweme, Man. (N. Criddle, coll.) and Mount Lehman, and Nelson, B.C. New to Canada.

Genus Dermacentor.

Dermacentor variabilis. Say, Det. Nuttall.

Numerous specimens of ♂ and ♀.

Hosts, Dog, cattle and man.

Locality, Aweme, Man. Coll. N. Criddle.

Dermacentor occidentalis, Neumann. Det. S. H.

4♂'s, and 3 ♀'s.

Hosts, *Lepus americanus*. ..

Locality, Treesbank, Man. Coll. N. Criddle.

Dermacentor venustus, Banks. Det. S. H.

Hosts, cattle, horses, man.

Locality, Kaslo, Pilot Bay, Osoyoos, and Huntingdon, B.C.

Dermacentor albipictus, Packard. Det. S. H.

Numerous specimens of ♂, ♀ and Os.

Hosts: horses, cattle, *Odocoileus lemionus*, *Odocoileus columbianum*.

Locality: Huntingdon, Peardonville, Vancouver Id., and Lillooet.

Genus Amblyomma.

Amblyomma americanum, L. Det. S. H.

1♂

Locality, captured on grass in muskeg, Aweme. Man. (N. Criddle, coll.)

References—

Neumann.—Revision des *Ixodidés*.

Hooker.—The geographical distribution of American ticks.

Banks.—Revision of the *Ixodoidea* of United States.

Hadwen.—The finding of *H. punctata*. 'Canadian Entomologist,' July, 1910.

Nuttall and Warburton, &c.—Ticks, Part II., 1911.

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I am indebted to Professor Nuttall for his help and determinations.

NOTE.—Owing to Dr. Stile's new classification of the Dermacentors, it is possible that some of the species recorded above may not prove to be correct, but will at any rate fall in with his three main classes.

I have the honour to be, sir,

Your obedient servant,

SEYMOUR HADWEN,

1st Assistant Pathologist.

The Veterinary Director General,
Ottawa.

APPENDIX No. 10.

A. WATSON, V.S. , SECOND ASST. PATHOLOGIST.

QUARANTINE AND EXPERIMENTAL STATION,

LETHBRIDGE, ALTA., March 31, 1912.

To the Veterinary Director General,
Ottawa.

SIR,—I have the honour to submit my report for the year ending March 31, 1912.

As in former years, the greater part of my work has been in connection with Dourine or *Maladie du Coït*, (a) in further research and experimental work at the Quarantine and Experimental Station, Lethbridge, and (b) in controlling or dealing with outbreaks of the disease on notification being given me by the Chief Inspector for Alberta.

Aside from this I assisted the inspector at Cardston in an outbreak of Glanders, in the testing of 45 horses and in the destruction of the 5 reactors. A suspected case of Glanders from High River, ordered by the Veterinary Director General to be held at this station for 1 year, was isolated here since June 25, 1910, was tested on June 6, 1911, reacted and was destroyed on July 13. This case has already been reported in detail by Dr. Hilton, who, with Dr. Hargrave, was present at the testing and post mortem examination.

In the absence of the inspector in charge of the Lethbridge district I inspected 1,715 cattle in quarantine for Mange, and in accordance with special instructions received, permitted their removal and shipment under license.

I also dealt with an outbreak of Hog Cholera in the Lethbridge district and directed the slaughter of the 230 hogs on the affected premises.

During the year I inspected for Dourine 1,705 horses, including 93 stallions, found 7 animals affected with the disease and caused their destruction. Those destroyed were located as follows: 1 at Raymond, 1 at Stirling, 1 on the Peigan Indian Reserve, and 4 in the High River district.

DOURINE.

The fact that occasional outbreaks of Dourine are still to be met with in Alberta and Saskatchewan does not indicate negligence on the part of your officers who have been detailed to deal with previous outbreaks, but rather that there are a number of tolerant or immune carriers of the infection, which do not offer the slightest clinical evidence of such infection, and which, therefore, it is quite impossible to recognize under natural conditions and by the ordinary means of a symptomatic diagnosis. The experimental work on dourine which was commenced at this station in the year 1905 by Dr. S. Hadwen and carried on by me since November, 1906, up to present date, has given us a fairly complete record of the disease as regards its nature and cause, pathogenicity, symptoms, course and duration, and, among other things, it has brought to light a number of important facts not only of scientific value and interest but bearing directly upon our ability and our inability in diagnosis and consequently in exercising efficient means of control and stamping out.

In 1904 and in 1905 Dr. Rutherford made note of the apparent mildness of many cases of infection in this country; he drew special attention to this in his various

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reports and made comparisons with the dourine of Asia and Africa which seems, he says, 'from all accounts, to run a definite course, the symptoms throughout being fairly well marked and the termination almost invariably fatal within three years at most.' Dr. Rutherford suggested that in this country where climate and other conditions are so different the virulence of the disease might become so modified and less fatal as to render recoveries more frequent; at the same time he gave warning that unless the recovery is complete and permanent 'it will be certain to render recognition more difficult and favour the perpetuation of the contagion in unsuspected chronic cases likely to cause periodical outbreaks of a more virulent type.' He saw the necessity of gaining precise and certain knowledge in this connection and ordered that a number of these mild or tolerant cases, some of which I think he himself selected, be held for a long period of observation and experiment. This was in 1905; the majority of these animals are surviving—7 years later. Others have been included during the intervening period and supplemented with cases that have survived experimental infection (the latter having the advantage of a complete history). Typical Dourine is well known and easy to recognize, needing no further description, but the principal historical facts concerning these typical, tolerant or recovered cases extending over such a lengthy period should be of much value and interest. I submit them separately, as an appendix, as Part I of a 'Further Report on Dourine'.

It is possible to draw a comparison between this experimental herd of horses, which includes many cases of infection naturally acquired as well as experimentally, and other herds or breeding studs in the country figuring in an outbreak of dourine, for the conditions of the experiments have in many respects been precisely similar to those that obtain under ordinary and natural conditions among horse owners. We have among our surviving animals at this station horses that have carried an infection for varying periods of time, extending in some cases to several years, without their betraying any definite or diagnostic sign of infection; also, animals which, after arriving at a certain stage of tolerance, show themselves more or less immune—repeated 'covering-contact' with infected stallions and inoculations of virulent strains of dourine-trypanosomes very rarely causing a recrudescence of symptoms or a visible reaction, and even then a very slight one. There is every likelihood that now and then a similar non-clinical 'carrier' exists among infected horses in the country, remains undetected and in later years, or when times and conditions are favourable, becomes the source of a further outbreak. To lessen this danger it has been necessary to enforce regulations prohibiting for one, two or more seasons, as seems advisable, the breeding of any animal which is suspected of having had 'covering-contact' with an infected animal; but even after that length of time and though the animal has continued in good health, it is, strictly speaking, unwarrantable to certify that a tolerated infection is not being carried. However, there must be a limit to the period of quarantine or detention, or the preventive measures would entail a more serious financial loss on the owners than the disease itself, but even as it is the prohibition of breeding when a large number of mares is concerned is the step that is most dreaded by owners and is apt to be the cause of untoward delays in obtaining reports or information of suspected cases.

The history of Dourine in any country where it has been known to exist does not furnish evidence that the killing of infected animals, depending wholly upon a symptomatic diagnosis, has sufficed to eradicate the disease. Announcements to that effect are, sooner or later, found to be premature, as shown by recurring or fresh outbreaks which cannot be attributed to importations from another country. A specific means of diagnosing non-clinical cases becomes not only essential for the complete success of a policy aiming at eradication, but has the great additional advantage of permitting a decision to be reached in a comparatively short space of time and of reducing to a

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minimum the period of the prohibition of breeding. For several years past this has been one of the principal objects of the dourine experiments at this station. The work has been pursued under most trying and difficult conditions, the laboratory building and equipment being totally inadequate for carrying on such work under the exact and constant conditions that it properly demands. However, progress was made and results were slowly accumulated which I considered of such importance as to justify me in applying to you for four months leave of absence in order to do some work in European laboratories, to familiarize myself with improved technical methods and the latest applications of serum-diagnosis, and at the same time subject my own methods and experimental results to the criticism and comparison of competent authorities. This leave of absence was granted me, Dr. Evans, of the Biological Laboratory staff of Ottawa, relieving me and taking charge at this station. I visited the principal veterinary laboratories in England and Germany; in Berlin, through the privileges afforded me by Professor Ostertag and the President of the Kaiserlich Gesundheitsamt I went to work in the Imperial Laboratories where specific methods of serum-diagnosis were being practised in connection with Dourine, Glanders, Contagious Abortion, Anthrax, &c.

The employment of these determinative methods constitutes the most exact and definite mode of diagnosis at present known to science; it is being rapidly adapted to more general use in health departments and will, I am convinced, have a wide field of usefulness in veterinary control work.

I wish to respectfully and earnestly recommend that this station be placed upon a permanent footing and provided with a properly equipped laboratory for the investigation of diseases of animals that are of especial importance to the live stock industries of western Canada, and especially for the serological diagnosis of Dourine and any other diseases in which serum-diagnosis offers the most suitable and practical means of efficient control.

Part II. of my 'Further Report' will deal with the serum diagnosis of Dourine. I am holding this back for completion and final conclusions until such time as I can make a final test of all experimental animals at this station with any others that may be available and with a proper number of healthy controls.

I have the honour to be, sir,

Your obedient servant,

A. WATSON.

Ass't Pathologist.

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APPENDIX No. 11.

SPECIAL REPORT ON HOG CHOLERA BY A. E. MOORE, D.V.S., CHIEF
TRAVELLING INSPECTOR.

OTTAWA, November 13, 1911.

Dr. J. G. RUTHERFORD, C.M.G.,
Veterinary Director General,
Ottawa.

SIR,—I have the honour to inform you that in accordance with your request, I have prepared a brief report with reference to outbreaks of hog cholera which I have dealt with, the origin of which is undoubtedly due to the feeding of uncooked city garbage and hotel swill.

The first outbreak of this kind that came to my notice occurred at Sudbury, Ont., in June, 1903. Four (4) premises were involved, 85 hogs died and 14 were killed. Two of the owners were hotel men, feeding the swill from their own houses; the third was a woman feeding swill collected around the town, and the other was a butcher who bought a lot of hogs from this woman. There was absolutely no other source of infection traceable. All the other hogs in the community were healthy and no outside hogs had been recently introduced into these herds.

In November, 1903, there was an isolated outbreak in a herd at Collingwood, Ont.; no source of infection could be traced, but the owner was feeding the refuse from the packing-house. At this time there was more or less hog cholera scattered throughout western Ontario, and it is quite possible that infected hogs may have been sent to the Collingwood packing-house.

In August and September, 1908, another outbreak occurred at Sudbury and Copper Cliff, starting on two farms both feeding slaughter-house refuse and hotel swill. At first it was suspected that the disease was brought from near Wallaceburg, Ont., but a careful investigation was made on the premises where the hogs originated at Wallaceburg and no trace of hog cholera was found.

In August, 1908, hog cholera occurred on a farm at Toronto; 400 hogs died and 717 were slaughtered. The following is an extract from my report on this case:—

‘Mr. Wilson (the manager) informed me that he had not bought any hogs for nearly a year, which were then some bears from Mr. Flatt, of Hamilton; no other hogs have come in contact with his since then.

‘Mr. Wilson feeds his hogs on hotel refuse and this refuse contains nearly every conceivable thing, pork rinds, ham and shoulder bones, bacon; chicken and other fowl intestines, beef refuse, mutton and veal refuse, besides all kinds of vegetables and slops.

‘We are at a loss to know the origin of this outbreak unless it came through contaminated food.’

In December, 1908, another outbreak occurred near Toronto, where 73 hogs died. No other source of infection could be attributed except from feeding the uncooked city swill.

In January, 1909, two more outbreaks occurred near Toronto. No source of infection could be discovered and both parties were feeding uncooked hotel swill. These two premises were several miles apart and no communication between them.

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In September, 1909, quite a serious outbreak of hog cholera occurred at Ottawa. Fifteen (15) premises were involved, 170 hogs killed and 54 died. In every instance garbage-fed hogs were the victims; absolutely no other source of infection could be found. Farmers' hogs in the same neighbourhood, which were never fed garbage, remained healthy.

Later, in September of 1909, I was called to Toronto to investigate an outbreak of hog cholera at Weston, three hundred and sixty-five hogs being involved. There were no contacts or recent importations. The hogs were fed on uncooked hotel garbage from Toronto.

I carefully examined the garbage in both the Toronto and Ottawa outbreaks and I found a great many uncooked portions of pork, such as rinds from bacon and ham, sausages, spoiled pork chops, roasts, and portions of ham and shoulders. I found in Toronto whole strings of raw, sour, mouldy sausages. The owner informed me that it was a frequent occurrence to find a bushel basket full in their garbage collections.

In August of the present year an outbreak occurred at Sault Ste. Marie and was principally dealt with by Inspector Perdue. I visited the Soo in September and I found, as did Dr. Perdue, that the outbreak was entirely among swill-fed hogs, and those in contact with them. No other source of infection could be found. Farmers' hogs in this neighbourhood not fed on garbage, remained healthy. The disease was found on twelve premises; 95 hogs died and 260 were killed.

Last September I visited Winnipeg, Man., on account of hogs dying of hog cholera near that city. In company with Inspectors McGilvray and Macintosh I made a careful investigation and in every case found that uncooked garbage-fed hogs were the ones affected. There was absolutely no other source of infection that could be found.

Three outbreaks occurred a little later at Helen Mines, Ont. At first it was thought that the disease might have been taken there from the Soo. This might have been true in one case but the other two of these outbreaks were, as far as I could determine, not in contact at all with the Soo hogs, but were fed on the swill from the railroad construction and mining camps.

In October of this year quite a serious outbreak of hog cholera occurred at Fort William and Port Arthur, and is reported by me as follows:—

'Immediately on my arrival and accompanied by Dr. Fraser, I visited some of the premises where hogs were dying and found the disease to be undoubtedly hog cholera.

'This outbreak, in addition to those at Winnipeg, Sault Ste. Marie and Kenora, is confined wholly to hogs fed on uncooked garbage. The disease started almost simultaneously on all the different premises in this district; there was absolutely no communicating or exchanging of hogs among these people, and they were scattered in all directions.

'About the last of August or the first of September the butchers ran very short of local pork and large shipments were rushed in from Winnipeg. It was about three or four weeks from this date, as far as I can learn, that the first hogs began dying near Port Arthur. I was told that a large quantity of United States pork loins came into Canada, as well as their cooked and cured meats.

'I made a very careful investigation of the whole district in company with Inspector Fraser, with the result that 622 hogs were killed on 24 premises, valued at \$5,500. Four hundred and seventy-five (475) hogs died previous to our visits.

'The garbage fed hogs in this district have *all developed* the disease, with the exception of one lot. I quarantined these hogs and ordered the owners to stop feeding garbage, according to section 8 of the Regulations.'

I made an inspection of a large number of hogs not fed on the garbage near Fort William and Port Arthur, but no evidence of hog cholera could be found.

You will notice that the western outbreaks occurred quite closely together; the one at Sault Ste. Marie started in August, at Winnipeg in September, at Kenora and

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Fort William the first part of October. Immediately previous to these outbreaks a large quantity of outside pork was shipped into these towns by the Winnipeg packers.

In conclusion I wish to say that in my dealing with hotel swill fed hogs I have found the most repulsive conditions. The premises, with the exception of a very few, were in a most unsanitary condition; many of them were indescribably filthy, and the stench almost unbearable; millions of flies swarming around, rats, dogs and crows feeding off the decomposed garbage, in fact everything reeking in filth.

I believe that this material should not be allowed to be fed except under strict supervision, not alone from the serious danger of spreading hog cholera infection, but also from a sanitary standpoint.

I have the honour to be, sir,

Your obedient servant,

A. E. MOORE,

Chief Travelling Inspector.

APPENDIX No. 12.

INTERNATIONAL COMMISSION ON THE CONTROL OF BOVINE TUBERCULOSIS.

OTTAWA, November 1, 1911.

To the Honourable MARTIN BURRELL,
Minister of Agriculture
Ottawa, Ont.

SIR,—I have the honour to present herewith a brief compilation of useful facts regarding animal Tuberculosis for the special information of farmers and others interested in live stock.

This treatise, which is devoid of technical terms, has been prepared by the International Commission on the Control of Bovine Tuberculosis, as a supplement to its first report, it being thought desirable to disseminate, as widely as possible, among those most concerned, accurate information regarding the disease.

I would recommend that this be printed for general distribution.

I have the honour to be, sir,

Your obedient servant,

J. G. RUTHERFORD,
Veterinary Director General and Live Stock Commissioner.

PRIMER ON TUBERCULOSIS.

FACTS FOR FARMERS AND OTHERS ABOUT THIS DISEASE.

Tuberculosis is a widespread disease affecting animals and also man.

Human beings and cattle are its chief victims, but there is no kind of animal that will not take it. Hogs and chickens are quite often affected; horses, sheep and goats but seldom, while cattle are the most susceptible of all animals.

NATURE OF THE DISEASE.

Tuberculosis is contagious or 'catching.' It spreads from cow to cow in a herd until most of them are affected. This may not attract much notice from the owner as the disease is slow to develop, and a cow may be affected with it for several months, and sometimes years, before any signs of ill health are to be seen.

This slow development is the chief reason for the great loss it causes to the farmer. He does not suspect its presence in his herd until perhaps a large number are diseased. If the disease developed rapidly and caused death in a few days, the owner would soon take steps to check its progress and protect the rest of his herd. Tuberculosis is slow and hidden in its course and thus arouses no suspicion until great damage is done.

HISTORY.

Where did tuberculosis come from? We do not know. History records it from the earliest times.

Over a century ago, its contagious nature was suspected and many facts were recorded to prove that it must be 'catching.' Doctors differed about it, and for a long time the question was hotly disputed. Finally it was settled by Dr. Robert Koch, a distinguished German physician, who discovered the germ of the disease in the year 1882, and named it *Bacillus Tuberculosis*. He proved by experiment that the disease is produced by these germs and without them the disease cannot be produced. It is now universally admitted that tuberculosis is a contagious disease and may be transmitted from animal to man.

In America the disease was introduced with early importations of cattle and has been with us ever since. Modern methods of transportation by rail and water have spread the disease from one end of the continent to the other. No part of the country is entirely free from it, but it is more prevalent near the great centres of population than in the remoter parts.

IMPORTANCE.

The importance of the disease must be estimated from two points of view, first, the loss it entails upon the cattle owner, and second, the danger of communication to human beings.

Consider first its effect upon the pocket of the owner of cattle, whether farmer, breeder or dairyman. A serious percentage of the dairy cows of the continent are affected and the disease is found in even a larger percentage of dairy herds.

The disease is commoner in some regions than in others.

It is no uncommon thing to find as many as 70 per cent or 80 per cent of the cows in a herd diseased. These animals will be in various stages of the disease, some recently infected showing no sign of ill health, others badly diseased, but outwardly appearing healthy, while a few are evidently breaking down and wasting away.

The loss to the owner is evident when a cow dies of the disease, or when an apparently healthy cow is slaughtered for beef and found so badly affected as to be unfit for food.

The calves in such a herd do not long remain healthy. They catch the disease before many months old and are a source of loss instead of gain.

Although the disease is most frequently found in herds that are more or less closely confined, such as dairy herds and pure bred cattle, other herds are by no means free from it. Even range cattle are sometimes affected and the infection spreads in spite of the open air life of the cattle.

Tuberculosis is common among hogs. The public abattoirs report that a serious percentage of all hogs inspected is found to be tuberculous.

The aggregate of these losses among cattle and hogs is enormous, amounting to millions of dollars every year, besides materially decreasing the food supply of the country.

Turning to the other aspect of the case, the danger of infection of human beings with tuberculosis from cattle, we have only to consider a few facts to realize its vital importance to every community.

Milk is the staple food of infants and young children and is usually taken in the raw state. If this milk is from a tuberculous cow, it may contain millions of living tubercle germs. Young children fed on such milk often contract the disease, and it is a frequent cause of death among them.

Meat from tuberculous cattle is not so likely to convey the infection for several reasons. It does not so frequently contain the germs, cooking destroys those that may be present, and lastly, meat is not consumed by very young children.

SYMPTOMS.

Before describing the symptoms or signs by which tuberculosis is recognized or suspected in a living animal, it is well to state that there is no symptom that can be relied on with certainty. Any of the symptoms may sometimes be caused by some other disease, and not one of them is characteristic of tuberculosis alone.

Many of the symptoms that are relied on by the human physician in reaching his opinion are not available in examining cattle. The thickness of the skin and chest wall, for instance, makes it difficult to detect a diseased condition of their lungs by listening to the sounds made in breathing, whereas this is comparatively easy in human beings.

It must also be clearly remembered that cattle may be very badly diseased and yet show no symptoms of ill health. They may be fat and sleek, looking the picture of health, while their lungs and other organs are full of tubercles. Such cases can only be detected by the tuberculin test.

As tuberculosis may attack almost any organ of the body, we may have in each case the symptoms connected with the part affected, as well as those affecting the general state of the body as a whole. We will take up in detail each of the more important symptoms suggestive of the disease.

Unthriftiness.

The animal is not doing as well as it should for the care and feed it is getting. Its coat is rough and its skin has lost its suppleness, and feels harsh and thick.

Loss of Flesh.

Along with the unthriftiness is noticed a gradual loss of flesh; the animal gets thinner from week to week. It appears to be pining away, and such cows have been known to dairymen for a long time under the name of 'piners,' or 'wasters.' After a time they are reduced almost to skin and bone.

Cough.

This symptom is only present when the disease is attacking the lungs or some part of the breathing organs. It is not a loud, sonorous cough, but rather a subdued and infrequent one, and may be heard only at such times as when the stable is first opened in the morning, or when the animal is driven. At a later stage of the disease it may be heard at any time of the day. Cows do not usually appear to cough up anything. This is because they do not spit. Most of the material coughed up from the lungs is swallowed, but many tuberculosis germs escape from the mouth in the form of spray or are discharged from the nose.

Enlarged Glands.

Enlargements in the region of the throat, especially when they cause difficulty in breathing, are very apt to be due to tuberculosis.

Loss of Appetite.

This symptom is not seen until the latter stages of the disease, when the animal is evidently wasting.

Bloating.

Sometimes the diseased glands in the chest prevent the usual passage of gas from the paunch to the mouth by pressing on the gullet. In this case the cow suffers from bloating and the paunch is often greatly distended with gas. This, however, is not a very frequent symptom.

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Diarrhœa.

Looseness of the bowels or 'scouring' is seen in cattle affected with the disease in the bowels. This kind of scouring cannot be cured by any known treatment.

Hard Lumps in the Udder.

When tuberculosis attacks the udder, no change can be detected at first, but after a time hard lumps can be felt in some parts of the organ after it is milked out. Milk from such an udder must not be used, as it is almost certain to be teeming with germs of the disease.

POST MORTEM APPEARANCES.

When the carcass of a cow affected with tuberculosis is opened, the disease may be found in any part of the body. Lumps (tubercles) may be present in the substance of an organ such as the lung or liver, or they may be growing on the surface. These lumps may be so small as to be scarcely noticeable, or they may be as large as the closed fist, or even larger. If one of the lumps is cut open, the inside is yellowish and grits on the knife like sand, or else is of a cheesy nature, soft and creamy or hard and dry.

The lung is a favourite place for tubercles, and should always be examined. Lymph glands are often the seat of tuberculous changes. When healthy a lymph gland is a little rounded body, not much larger than a good sized bean, the largest only the size of one's thumb. They are found all through the body and when healthy are so small as to attract very little attention. Tuberculosis may cause them to grow to an enormous size, sometimes as large as a child's head. In this condition they are similar to the tuberculosis lumps already described. Those lying between the lungs and in the throat are the most frequently affected.

Tubercles may be found in any part of the body, glands, lungs, liver, bowels, kidneys, womb, udder or even bones. The muscles and skin are seldom affected.

THE TUBERCLE BACILLUS.

The germ of the disease, the tubercle bacillus, is a tiny, slender, rod-shaped body. Several thousands of them placed end to end would be needed to measure an inch, so that they are quite invisible to the naked eye. A powerful microscope is needed to see them.

Once the bacillus has gained lodgment inside the body of an animal, it begins to grow and multiply. It gets longer, and when full grown, divides crosswise, making two out of one. Each of these goes through the same process, the two become four, the four eight, the eight sixteen, and so on indefinitely.

This multiplication takes place quite rapidly when conditions are favourable, a few hours only being required for the birth of each generation. Nature, however, does not permit this process to continue long without offering some resistance. The forces of the body are aroused to action and a battle begins between the tissues of the body and the army of the invaders.

The first line of defence is composed of the white cells of the blood which hurry to the scene of action and endeavour to destroy the invaders by eating them up. Sometimes they are successful and the bacilli are destroyed, the infection checked. Often they fail in their object and are themselves destroyed and the multiplication of the germs continues.

The second line of defence is found by the cells of the tissue invaded by the germs. These cells arrange themselves in a circle around the germs and try to form a living wall between them and the rest of the body. This barrier gradually becomes thicker and thicker and forms a little hard lump or tubercle, from which the disease gets its name. If this wall is complete and successfully imprisons the bacilli, these gradually die and the disease in that particular spot is arrested.

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Frequently, however, both these safeguards are overcome. The germs break through the barriers and are carried in the blood stream or lymph channels to other parts of the body. New points of attack are selected and the process begins again, but with less chance on the side of the animal. As the tubercles increase in number, the power of the body to grapple with them becomes less and less, and gradually the animal falls a prey to the disease.

The tubercle bacillus does not multiply outside the body of an animal. It can live for a long time in favourable surroundings, such as dark and dirty stables. Sunlight soon destroys it. Freezing does not hurt it, but it can only stand a moderate amount of heat; exposure to 149 degrees Fahrenheit for twenty minutes kills it. Protected by a layer of dried mucus, such as is coughed up from the lungs, it withstands drying, light, and ordinary disinfectants, but is readily killed by steam or boiling water.

HOW THE DISEASE SPREADS.

Sooner or later the tuberculous cow begins to give off the germs of the disease. The germs escape by the mouth and nose, the bowels, in the milk, and in discharges from the genital organs. When the germs are being given off in any of these ways, the disease is known as open tuberculosis.

Germs discharged from the mouth and nose are coughed up from the lungs and are sprayed over the food in front of the cow or are carried in the air for a time until they fall to the ground. Cows in adjoining stalls may take in these germs in the air they breathe or in the food they eat, and so contract the disease.

Germs discharged from the bowels are mixed with the manure, and may infect cattle and hogs that are allowed to pick over the dung heap. The practice of having hogs and cattle together in the same yard is sure to result in the infection of the hogs, if any of the cattle are affected. The germs in the manure come from matter that is coughed up and swallowed, and in some cases from tuberculosis in the bowels themselves. Manure containing tubercle germs may easily infect the milk. Particles of dried manure may fall into the milk pail from the skin of a dirty cow or be accidentally flicked off from the tail and fall into the milk. Straining the milk afterwards only removes the larger particles. The smaller ones, including the germs, remain in the milk.

When the udder is tuberculous, the milk contains the germs in vast numbers. Such milk may look and taste perfectly good, but readily transmits the disease to young animals. It is very dangerous to children. Hogs and calves are very readily infected by it.

HOW A HERD IS INFECTED.

Tuberculosis may be introduced into a healthy herd in a number of ways:

1. By the purchase of a bull or other animal that is infected with the disease. This animal may be apparently healthy at the time of purchase, but if it contains the germs, the disease may develop and spread to other cattle. New animals should only be bought from a herd that is known to be healthy.
2. By feeding calves with milk, buttermilk or whey that has come from tuberculous cows. A farmer may have a healthy herd, but if he brings home skim milk from a creamery and feeds it to his calves, he may give them the disease. Such milk should be rendered safe by boiling or pasteurizing it.
3. By showing cattle at fairs and exhibitions where no proper care is taken to keep out diseased stock, or to disinfect the stables.
4. By shipping animals in cars that have not been disinfected, as they may have recently carried diseased cattle.
5. By allowing cattle to graze with diseased ones, or to come in contact with them over fences.

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THE TUBERCULIN TEST.

Tuberculosis develops so slowly that in many cases it is months, and sometimes years, before any symptoms are shown. During this period, the infected animals cannot be distinguished from the healthy in any ordinary way. There is a test, however, which does no harm to the healthy, yet detects the diseased ones practically without fail. This is known as the tuberculin test, because the substance used in making it is called tuberculin.

WHAT IS TUBERCULIN?

Tuberculin is a fluid containing the products of the tubercle germ without the germs themselves. As it contains no living germ, it cannot convey the disease. Great skill is required in its preparation. A special fluid (or culture medium) is prepared and the tubercle bacilli planted in it, great care being taken to keep all other germs out. The fluid is then placed in a special kind of incubator and kept at the temperature of the animal body. Under these conditions, the germs grow and multiply. Gradually the fluid becomes filled with the products of the germs. When the right point is reached the fluid is heated sufficiently to kill the germs which are then strained out. The remaining fluid is tuberculin.

Tuberculin does not harm healthy cattle, even in large doses, but on diseased animals it produces a marked effect. This is shown by a feverish attack which comes on about eight to twelve hours after the tuberculin is administered, lasts a few hours, and then subsides. This temporary fever is called the *reaction*, and animals which show it are called *reactors*. The value of the test lies in the fact that diseased animals react while healthy ones do not.

RELIABILITY OF THE TEST.

The tuberculin test in the hands of a competent and experienced man is much more accurate than any other method of detecting tuberculosis. The records of large numbers of tests made by Government officials show that, with certain precautions, it is accurate in 98 per cent of the reactions obtained. This gives a margin of a possible 2 per cent of error and this small number may be still further lessened by care in making the test. For practical purposes any animal that reacts must be considered tuberculous.

LIMITATIONS OF THE TEST.

The test should not be applied to cows that have just calved or are about to calve, as the temperature at this time is apt to vary considerably from the normal. For the same reason it should not be applied to any animal that is in a feverish condition from any cause.

The test fails to detect the presence of the disease in the animal that is very recently infected. The disease has to make a little progress before the test reveals its presence, and in the beginning of each case there is a period between the entrance of the germs into the body and the time when they have multiplied sufficiently for the test to reveal their presence. This is called the period of incubation and lasts from ten days to two months.

When the disease is far advanced and the animal is wasting, the test sometimes fails to detect it. This is not of much practical importance as such cases can generally be recognized without the aid of tuberculin.

PROTECTIVE INOCULATION.

For some years efforts have been made to discover a method of rendering cattle immune to the disease in such a way as men are protected from small-pox by vaccination. Up to the present these efforts have been only partially successful, and until the methods in use have been perfected by further investigations, they cannot be recommended as of practical use in the suppression of the disease.

SUPPRESSION OF THE DISEASE.

The first step in getting rid of the disease is to find out how many of the herd are affected by it. This is done by applying the tuberculin test. This will show a larger or a smaller number of the herd to be affected, and the proper course to pursue will depend largely upon the proportion of the reactors in it.

Suppose that only a few cattle react, say fifteen out of a hundred, or in that proportion. In this case the reactors are first carefully examined and if any of them show symptoms of the disease by coughing, loss of condition or any other of the signs by which the disease is recognized without the test, such animals should be slaughtered.

The other reactors should then be entirely separated from the healthy cattle. If possible they should be put in a separate building, but if this cannot be done, a tight partition should be built between the diseased and the healthy cattle and separate ventilation provided. The person who attends to the reactors should not go near the healthy animals, as he may carry the infection to them on his hands, clothes or boots. For the same reason, the feeding and watering must be done with separate utensils.

When at pasture, the reactors must not be put into a field where they can reach across a fence to healthy cattle. Whenever a calf is born among the reactors, it should be immediately separated from its mother and brought up by hand or on a healthy cow. The calf is usually born healthy, but would soon catch the disease from its mother if allowed to remain with her.

The milk of reacting cows may be used if it is first boiled or heated to a point sufficient to kill the germs. This heating to a point less than boiling it is called *Pasteurizing*, and is safe provided all the milk reaches the required degree of heat and is kept there sufficiently long. For this it is necessary to keep the milk for twenty minutes at 149 degrees Fahrenheit or for five minutes at 176 degrees Fahrenheit.

This system of dealing with tuberculosis in a herd was planned by Professor Bang, of Denmark, and has been very successfully followed in that country for some years. It has the advantage of allowing the reactors to be made use of while a sound herd is being built up. Under this system the sound herd increases in numbers as healthy calves are added to it, while the diseased herd becomes smaller as the reactors die off or are killed as open cases of tuberculosis. Finally a point is reached where only a few reactors remain and the owner will then find it to his interest to kill them rather than have the trouble of keeping them isolated.

Some time is required for the successful carrying out of the Bang system, and the owner must be prepared to follow it steadily and faithfully for the whole time that is needed, which may be several years. During this time, the healthy herd must be tested every six months and any reactors removed to the diseased herd. At the same time, a sharp lookout must be kept for animals showing definite symptoms of the disease. These should be destroyed promptly as they are the most dangerous source of infection.

DEALING WITH A BADLY INFECTED HERD.

Where the test shows more than half the number diseased a somewhat different plan is required than the Bang system. This herd is so badly affected that the non-reactors cannot safely be considered healthy. Many of them are sure to have been infected with the disease quite recently so that the test fails to detect it. These will react at the next test and in the meantime may develop the disease so rapidly as to infect others. This will repeat the difficulty occurring at the first test, and it would be a long and tedious process of weeding before even a small but perfectly healthy herd could be established.

For these reasons it is better to treat such a herd as if it were entirely diseased, and to begin with the new-born calves to build up a healthy herd. The method from this point is exactly the same as the Bang system, except that as there are no healthy cows to act as foster mothers, the calves must be raised on pasteurized milk. At six

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months old, the calves are tested and reactors are transferred to the other herd. This plan was devised by a German veterinary surgeon named Ostertag, and is known as the Ostertag system. It is very successful when carefully carried out.

While getting rid of the disease by whatever system may be adopted, an animal should never be bought for the healthy herd unless known to be healthy. The tuberculin test should be applied and if possible the animal should be selected from a herd that is known to be free from tuberculosis. New purchases should be isolated or kept apart from the healthy herd and if possible from each other for at least three months, when they should be re-tested to make sure they are healthy before putting them with other cattle.

SANITATION.

Dark, dirty, crowded stables are favourable to tuberculosis. Under these conditions the disease spreads rapidly and is only kept out with difficulty.

Clean, airy, well-lighted stables on the other hand, are unfavourable to the development of the disease. If brought into such a stable, it does not spread so rapidly and is not so difficult to get rid of as in the first case.

A well built, sanitary stable need not be made of expensive material or of elaborate design, but should have plenty of light, air and drainage.

Light is very important. Direct sunlight is a great destroyer of germ life. Tubercle bacilli soon die if exposed to sunlight. It is a disinfectant always ready to work without cost. Sunlight is also necessary to the health of animals. Men deprived of it for any length of time, as prisoners in jail, become pale and lose the appearance of health. Cattle that are constantly confined in dark stables become lowered in vitality and are ready to catch any disease with which they come in contact. For these reasons the cow stables should have plenty of windows on two or more sides if possible, so that the sunlight can reach every part of the interior some part of the day.

Pure air is also very important. In badly ventilated stables, the air is breathed over and over again, until it becomes more or less poisonous. Animals kept in such conditions become gradually reduced in vitality. This change may not be noticeable to the observer, but becomes apparent if the animal is exposed to disease. It readily contracts disease and does not recover from it readily.

Stables should therefore have plenty of air space for each animal. This requires the ceiling to be high, the stalls roomy and the passages wide. In addition to this ample air space, some way of changing the air in a stable must be provided. This is done by suitable openings in the walls and roof and comprises the system of ventilation.

VENTILATION.

Ventilation to be successful must provide for two things, first, the removal of the foul air from the inside and second, the bringing in of fresh air from outside the building. No system is good that fails to accomplish these objects, without causing unnecessary draughts.

The usual way is to bring in fresh air through open windows, and in cold weather, through ventilating shafts, which may be concealed in the walls or beneath the floor. The foul air is removed by open windows and by ventilating shafts from the ceiling to the roof, where they are usually protected by a hood. When both inlets and outlets are proportioned to the size of the building, there should be a constant circulation of air, and no sensation of closeness should be perceptible in the stable.

DRAINAGE.

Drainage removes the liquid refuse from the stable by suitable gutters and drains. It cannot do this unless the floor is water-tight, and concrete flooring is therefore recommended. Urine leaking through cracks in the floor until the soil beneath is saturated is a frequent source of foul odours and unhealthy stables.

CLEANLINESS.

Since the manure of tuberculous cattle often contains living tubercle germs in vast numbers, the importance of keeping it well cleaned out of the stable is readily seen. Such manure is not only dangerous to other cattle in the stable, but may be the means of conveying the disease to children. Often cows are seen with their flanks encrusted with dry dung. Parts often break off while the cow is milked and some of it is likely to fall into the milk pail. The larger lumps are strained out, but the smaller particles remain, and also the tubercle germs which are small enough to pass through any strainer. These stay in the milk and make it a fruitful cause of the disease in the young.

Stables should be cleaned out often and the manure put where it cannot be picked over by hogs or cattle. These animals are easily infected in that way. Cleanliness also includes keeping the walls and ceilings free from dirt, dust and cobwebs. These are all good resting places for disease germs.

Whitewashing the interior of the stable at least twice a year is a great aid to cleanliness, and also has a distinct effect in destroying disease germs. In many municipalities, dairy stables are required to be whitewashed at regular intervals, and it is a practice that should be universal.

MEMBERS OF THE INTERNATIONAL COMMISSION ON THE CONTROL OF BOVINE TUBERCULOSIS.

J. G. RUTHERFORD, C.M.G., V.S., H.A.R.C.V.S., Veterinary Director General and Live Stock Commissioner of the Dominion of Canada, Ottawa, Canada; Chairman.

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APPENDIX No. 13.

THE CONTROL AND ERADICATION OF GLANDERS.

By C. D. MCGILVRAY, M.D.V., Winnipeg, Canada.

In dealing with this subject and presenting it for consideration, it is my intention to place before you certain features which have impressed themselves upon me, during the past seven years, while actively engaged in dealing with the control and eradication of glanders, through the use of mallein, among horses in the province of Manitoba.

While glanders has been considered, both by the veterinary profession and intelligent horsemen, as a disease which, on account of its nature, should be controlled and eradicated, still the 'bete noir' has apparently been as to what measures should be adopted and followed as a means of effecting this end with the least material sacrifice.

The various policies propounded and methods adopted have shown a wide divergence and the greater the magnitude, or scope, of the field under observation, the less tenable have many of them appeared.

Without entering into any apparent reiteration or descanting upon these, it would appear that the most common procedure in dealing with outbreaks of glanders had been directed towards animals showing plainly discernible clinical symptoms, such animals being destroyed, while other contact horses, if not manifesting clinical evidences of the disease, were often disregarded, or, at best, placed under quarantine restrictions as appeared exigent for a short time, at the end of which, if they did not manifest clinical symptoms of the disease, restrictions and observations usually terminated. It was not sufficiently realized that horses could be affected with occult, or concealed glanders, remaining in this latent condition even for several years and, while nevertheless diseased, might, to all outward appearances, be healthy. Therefore quarantining of itself, to be of any avail as to determining even possible freedom from the disease, would require to be for a much more extended period than was usually imposed.

Again when the necessary steps were taken to ascertain the actual condition as to health of contact animals, by the use of mallein, and where such animals reacted to the test, slaughter was not, in many cases, enforced, nor, on the other hand, were definite restrictions or limitations placed upon them.

This was the state of conditions which existed in the province of Manitoba prior to the year 1905, and, as a result, glanders had become widely distributed throughout the province with a marked increase in prevalence.

Through the efforts of Dr. J. G. Rutherford, C.M.G., Veterinary Director General for the Dominion of Canada, Manitoba was, during February, 1905, brought under Federal control, and placed under the operations of the Contagious Diseases of Animals Act. This responsibility having been assumed by Dr. Rutherford, the policy embodied in the regulations relating to glanders drafted by him was put into practical operation and consistently carried out as a means, if possible, of effectively dealing with and eradicating glanders from the province, the field work in connection with which I took charge of, under his directions, during February of the year 1905.

This policy, in brief, was that all animals affected, or suspected of being affected with glanders, should be inspected and submitted to the mallein test, and all which definitely reacted forthwith slaughtered, compensation being paid to owners as pro-

vided for by the Contagious Diseases of Animals Act, at the rate of two-thirds the animal's value, with a maximum valuation of \$150 per head for grade animals and \$300 for purebreds. Any animals giving doubtful or unsatisfactory results at the time of first test were not slaughtered but kept under close quarantine restrictions, and again submitted to the mallein test at the expiration of fifteen days from the time of the first test. If, upon retest, they proved negative they were released, while, on the other hand, if they reacted they were forthwith slaughtered and the owners compensated, as provided for.

In actual outbreaks of the disease when any of the animals under control were clinically affected, these, together with any other horses on the premises, were tested. All reactors were promptly destroyed and the owners ordered and instructed as to the satisfactory cleansing and disinfection of the premises by means of linewash and carbolic acid together with the disinfection of all other articles and utensils which might have been in use, to the satisfaction of an inspector. The animals which were negative to the first test, were placed under quarantine restrictions for a further test before being released. This retest was conducted at the end of fifteen days from the time of the first test, and if they again proved negative to the test, they were released, while, if any of them reacted, they were destroyed and the premises again cleansed and disinfected.

With the view of tracing the source of infection in outbreaks, owners were closely questioned as to the history of the various horses on their premises. Further searching inquiry was also made as to any possible contact, directly or indirectly, of other horses with the diseased animals, either adjacent or remotely situated. Upon receiving this information, which was carefully noted, steps were taken to trace up, locate, and deal with all horses and premises to which suspicion was thus attached, and such suspects were then submitted to the mallein test.

While this, as you will see, involved a considerable amount of labour and detail work, still it has shown itself to be an essential factor in the control and eradication of glanders.

The results of our work have shown us that in the control of glanders, efforts must largely be directed towards restricting all traffic and migrations of reactors and contact infected animals. Almost invariably where outbreaks of glanders have been found in what has hitherto been a healthy stud, such outbreaks have originated from and been caused by the introduction on to the premises of occult affected animals, which, at any time, were not showing any discernible clinical symptoms, but were to all outward appearances healthy.

The view has been somewhat prevalent that a horse affected with glanders may only be capable of transmitting infection when clinically affected either with a visible nasal discharge or farcy buds. Such, however, is erroneous. While no doubt clinically affected animals, especially those having a profuse nasal discharge, are more highly dangerous and infective than occult cases, nevertheless it must not be overlooked that many of the latter are affected with concealed lesions as of the nasal passages, larynx, trachea, or lungs, and in the case of the latter (concealed pulmonary glanders) the lesions may involve considerable areas having suppurating foci discharging bacilli which are in turn expelled by normal expiratory movements. Again, sooner or later, many of these become clinical. Thus all doubt should be removed as to the dangerous nature and infectiveness of a very large number of these occult cases.

In the clinical examination of horses for glanders, the condition of the submaxillary glands should always be carefully examined and an indurative, bosselated, condition of these glands, even in the absence of any visible nasal discharge or ulceration, must be regarded with suspicion. The absence of a visible ulceration of the nasal mucosa does not by any means exclude the possibility of glanders being present, as even in clinical cases a visible ulceration on the septum or under the alax is not always present, ulceration being often situated higher up, and therefore invisible.

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In connection with the foregoing statistics, it will be observed that, under the method followed preceding 1905, when only clinical cases were destroyed, the disease was on the increase.

Under the policy which was introduced and put into operation in 1905, attention was immediately directed towards all premises upon which cases of glanders had been destroyed, or reported during the preceding year. Curious as it may seem, almost invariably, among the contacts of cases previously dealt with, it was found that a very large number of these contacts had, in the meantime, developed clinically, hence the work during this year consisted largely in tracing up and dealing with the contacts of previous outbreaks.

During the year 1906, while the number of horses tested was slightly less than the preceding year, the number found to be diseased was less than one half.

During 1907 horse owners and practising veterinarians, now being entirely in sympathy with and having confidence in the work being done, began to report freely any cases to which suspicion might be attached, as shown by the consequent increase in number of horses inspected and tested, yet while the number of horses inspected and tested was considerably increased, the number found to be affected was very greatly diminished.

The same policy was consistently followed during the succeeding years with a more pronounced decrease each year in the number of animals found to be affected and destroyed, until, during this year, up to the present time (August 19, 1911) no cases of glanders have been detected.

In the carrying out of this work, as a result of careful observations, certain conclusions have impressed themselves upon us regarding the use and value of mallein, which would seem to be worthy of consideration.

THE USE AND VALUE OF MALLEIN.

In testing the clinically affected horses, they invariably, with the exception of a few cases which prior to injection had high temperatures exceeding 102° F., gave positive results, and showed well marked thermal reactions, exceeding 2° over the highest pre-injection temperature, accompanied by typical infiltration at seat of inoculation and associated in most cases, with constitutional disturbances as manifested by increased respirations and inappetence.

The cases having high initial temperatures (autogenetic) in the absence of a further thermal increase after injection, however, gave characteristic local reactions, associated with more or less constitutional disturbance.

Mallein therefore, in our hands, demonstrated an unmistakable affinity for clinical cases of glanders. Such being the case, no reason can appear to exist why this selective affinity should not be maintained when applied to occult cases.

The common acceptance of a reaction has been given as an increase in temperature of 2° over the average pre-injection temperature, associated with local and organic reactions. This, after all, to those who have given the matter serious consideration, is somewhat indefinite, if not misleading. A very important feature has apparently been overlooked in not keeping in view the fact that normal temperature is not a fixed quantity but varies in individuals according to environment, location, seasons, &c. Throughout many districts of western Canada, the normal temperature of horses presents a wide range, varying from 99° to 102° F. During the greater part of the year, the average normal temperature has been found to be about 101° F., just as many being found with temperatures over that mark as with temperatures below.

If any hard and fast rule was applied of an increase of 2° constituting a reaction, the individual with a temperature of 99° to-day would, to-morrow, as a result of mallein injection, if the temperature reached 101.5° F., be classed as a reactor. Nevertheless the temperature may even then be within a normal range. Again, horses frequently have temperatures of 99° and upon the succeeding day, without any

injection of mallein may present a temperature of 101° to 102° maintained during the entire day.

I am somewhat inclined to think that this is a pitfall into which many have fallen and may to some extent explain why they have encountered so many reactors which have never developed clinical symptoms and which, upon retest, fail to manifest any reaction and have been wrongly classed as 'ceased reactors.' In reality many such animals never reacted to the test as their temperatures after injection were still within a normal range and while possibly not altogether satisfactory, were not, in the true sense, reactors. It would seem, therefore, that, in the intelligent application and use of mallein, it is not only essential to determine the single individual's apparent normal temperature but also to determine the normal range of temperature for horses in the area under observation.

It is usually accepted and acknowledged by those engaged in dealing intelligently with mallein in the control of glanders that animals which have shown a slight, or doubtful, reaction to a first mallein test, may subsequently either fail to react or to do so but slightly, or, on the other hand, may even show a pronounced reaction, without, in the meantime, developing any external manifestations of disease. This fact has apparently given rise to a considerable amount of controversial comment. Close observations have led me to conclude that the animals which entirely fail, or cease, to react are usually those which have not given a characteristic reaction to a first test. Those which have shown a positively characteristic reaction to a first test seldom fail to react more or less to a second test, but may fail to react definitely to some subsequent test which may result, in some animals, from an acquired tolerance to mallein induced in them by repeated injections. It is advisable, I think, to consider ceased reactors, so-called, as a class comprising at least two distinct sub-classes, viz.:—

A Pseudo ceased reactors.

B. Authentic or actual ceased reactors.

Pseudo ceased reactors.—Under this heading may be considered all animals which have given a doubtful or non-characteristic reaction to a first test, but which fail or cease to react to subsequent tests. In the control work of glanders on a large scale, there will necessarily be found a large number of animals which, for some reason or other, may give doubtful results to a first test and which, upon retest may prove entirely negative. In the true sense these are not ceased reactors, as, in the first place, they had not given a characteristic or positive reaction and, upon proving negative to a second test, may as a general rule be considered innocent. This class has, to my mind, been largely drawn upon by those tending to disparage the value of mallein.

Authentic, or actual, ceased reactors.—In the true sense of the term, a ceased reactor is an animal which has given a characteristic or positive reaction to the test, but which has proved entirely negative, or failed to react, even typically, to subsequent tests. This class I do not consider to be at all as numerous as it is alleged by some, being of the opinion that included in this class by them are many which should rather be classed otherwise.

In the case of authentic, or actual, ceased reactors, whether from an acquired tolerance as a result of repeated malleinization, or a supposed recovery, I consider them as a dangerous class to which suspicion must be attached from the fact that out of their numbers arise individuals responsible for fresh outbreaks, many instances of which could be cited in substantiation thereof.

A very interesting feature which has been observed in connection with many of these so-called ceased reactors which have been kept under official supervision, is that having reacted more or less definitely to a first and second test, they may subsequently fail to react to third, fourth and further tests if made within intervals of thirty, sixty and ninety days, but if allowed to remain without being subjected to mallein for a period of twelve months or more, they then, when tested again, show a pronounced reaction.

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In illustration I append herewith records dealing with the case of one of these ceased reactors:—

* During July, 1908, an outbreak of glanders was detected and dealt with by officers of the department at High River, Alta. Thirteen horses on the premises were inspected and tested, eight of which reacted and were destroyed. Of the other five, four were entirely negative while one, a black stallion named 'Fritz' reacted, but on account of the especial value to the owner, at his request, was held for further test.

RECORD OF TESTS OF BLACK STALLION "FRITZ".

First Test.

Temp. before injection July 13, 1908.		Temp. after injection July 14, 1908.			
3 p.m.	7 p.m.	7 a.m.	10 a.m.	1 p.m.	4 p.m.
100 ⁴	100 ¹	103	103 ²	102 ⁴	102

Maximum swelling 3-in. x 4-in. No clinical symptoms present.

Second Test.

Temp. before injection Aug. 22, 1908.		Temp. after injection Aug. 23, 1908.			
6.30 p.m.	9.30 p.m.	8 a.m.	10.30 a.m.	2 p.m.	5 p.m.
100	100 ⁴	105 ²	105 ²	103 ⁴	104

No clinical symptoms present and owner still refused to have animal destroyed. During December, 1908 the owner had the horse tested privately. No official record of the test results, which were supposed to be negative.

* (I am indebted to Dr. Rutherford for placing the official records dealing with this case at my disposal.)

Fourth Test (third official test).

Temp. before injection Jan. 13, 1909.		Temp. after injection Jan. 14, 1909.				
2 p.m.	9 p.m.	7.30 a.m.	10 a.m.	1 p.m.	3.30 p.m.	7.30 p.m.
100	100	100 ²	100 ²	102	101 ³	101

Maximum swelling 2-in. x 2-in.

Fifth Test.

Temp. before injection Jan. 24, 1910.		Temp. after injection Jan. 25, 1910.				
6 p.m.	9 p.m.	5.30 a.m.	8.30 a.m.	11.30 a.m.	2.30 p.m.	5.30 p.m.
99 ²	100 ¹	100 ²	100 ²	101 ¹	100 ⁴	100

Maximum swelling 3½-in. x 4-in.

During June, 1910, arrangements were made by which this horse was procured from the owner and removed to the Quarantine Station at Lethbridge, where it was kept isolated under the supervision of Dr. A. Watson, one of the pathologists of the department. It was allowed to remain without being subjected to mallein for a period of about seventeen months and was then submitted to the test on June 6 and 7, 1911, by Dr. Watson in the presence of Drs. Hilton and Hargrave, also officials of the department. The results of the test are as follows:—

Temp. before injection June 6, 1911.			Temp. after injection June 7, 1911.				
7 a.m.	12 a.m.	10 p.m.	8 a.m.	10 a.m.	1 p.m.	4 p.m.	10 p.m.
100	99 ²	101	102	103 ²	103 ³	103 ⁴	101 ⁴

Maximum swelling 7-in. x 7-in.

After injection there was present a slight lachrymal discharge and tenderness of submaxillary glands, also slight *oedema* under the abdomen anterior to the sheath.

On July 13, this horse was destroyed at the Quarantine Station and a careful post mortem examination was made by the pathologist, Dr. Watson, in the presence of Drs. Hilton, Hargrave and Gallivan, veterinary inspectors of the department.

No clinical symptoms were in evidence and the horse was in fair condition prior to slaughter.

Post mortem.—Careful examination of the submaxillary lymph glands and of the mucosae lining the nasal passages, fauces, pharynx, larynx and trachea revealed no lesions. Of the cervical lymph glands some appeared hæmorrhagic; others showed slight pigmentation and slight calcified deposits. Bronchial glands apparently normal.

Lungs.—On the surface of the left lobe a typical glanders nodule was observed and many small hard bodies could be felt embedded in the parenchyma, which, upon section, were found to be calcified glanders nodules, varying in size from a pin head to small peas. Of the mediastinal glands the anterior ones showed calcified deposits. Spleen appeared normal. In the liver numerous typical lesions of glanders were in evidence, many calcareous nodules being situated under the capsule, one nodule of large size was encysted with a cavity containing pus; groups of encapsulated nodules with softening centres were embedded throughout the liver substance.

In determining a thermal reaction, I consider that where the temperature recorded at intervals of two hours from the eighth to the twentieth hour after injection does not reach and exceed 2° over the highest initial temperature within a normal range, and is unaccompanied by a definite typical reactionary swelling at seat of inoculation or marked constitutional disturbance, more especially where the acme has been reached before the twelfth hour after injection and begins thereafter to recede to the normal range, it is not a characteristic reaction from glanders infection. When the same degree of thermal reaction is obtained, accompanied by a definite local infiltration at seat of injection, and pronounced constitutional disturbance, it indicates a glanders infection.

When the thermal reaction reaches and exceeds 2° with the rise of temperature maintained from 8 to 20 hours after injection, presenting the highest peak from the twelfth to the eighteenth hour, associated with a reactionary infiltration at seat of injection, even in the absence of any marked constitutional or organic disturbance, it indicates a glanders infection.

In judging a typical local reactionary swelling, observations lead me to conclude that it depends not so much on the actual size as measured across its surface as on its nature as to shape, size, tenseness and presence of pain. The typical reactionary infiltration is nearly circular in outline, has a tendency to increase its area from the eighth hour after injection and, at the same time, extends to and involves the deeper seated, underlying muscular tissues, giving rise to an acute myositis over which the skin becomes adherent. To the touch it is tense, hot and extremely painful, and if the neck has been the seat of injection, cord-like swellings (lymphatic) in some cases, may extend to the shoulder, causing pain and difficulty of shoulder movement. When the infiltration assumes such a nature, I consider it a typical reactionary swelling irrespective of its surface measurement.

When an infiltration is not typical, it rarely exceeds a diameter of three inches and to the touch is found to be slightly painful, soft and movable, remaining superficial in the skin and sub-cutis, not extending to or involving the underlying muscular tissues, nor perceptibly increasing in area after the eighteenth hour and has a tendency to become absorbed and gradually disappear thereafter. It does not extend towards the shoulder joint nor cause stiffness of movement.

Oblong infiltrations should be carefully observed, as even when of large size, they are frequently not typical, being a dependent oedema, usually resulting from the

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manner in which the injection has been made, causing an oblong fold to become inflated.

These oblong oedematous infiltrations should be differentiated from the cord-like swellings extending from a typical circular reactionary infiltration, as they tend to become more rapidly absorbed, do not present any of the other features such as extreme painfulness, are soft and movable and do not extend to the deeper seated muscular tissues nor cause stiffness of shoulder movement as is characteristic of the typical reactionary infiltrations.

In retesting horses which have given a more or less definite reaction to a first test, my experience has been that the local reaction at second test may be less pronounced and temperature acme more variable and, while in a few cases the temperature acme has been observed from about the eighth hour after injection, more frequently it remained in abeyance until at and following the fourteenth hour.

In actual outbreaks where any of the animals under control are showing unmistakable clinical symptoms, all contacts should be regarded as possibly infected. Those giving a definite and characteristic reaction to the test, clinical or otherwise, should be considered as diseased and dealt with accordingly. Those in which the result of the test is negative or non-characteristic should be held under proper restrictions for a further test within a reasonable time. This has been found quite satisfactory by us when conducted at the end of fifteen days. If, at this time, they prove entirely negative to the test, they may safely be considered as non-infected. While, on the other hand, if any react, they should be considered as diseased and dealt with accordingly.

Any contact animals having temperatures over the normal range unless some other well defined cause is in evidence to satisfactorily account for same, if upon testing, even in the absence of a further thermal increase, or a sudden drop or decline in temperature they exhibit a typical local infiltration at seat of injection, accompanied by constitutional disturbance, should be considered as incubatively affected.

The course, as outlined above, having been pursued and consistently carried out in our operations, has been fruitful in preventing secondary outbreaks, none of which have been encountered by us during the period under observation.

Disparagement as to the value of mallein has been made by some, who claim that animals suffering from certain febrile affections and conditions other than glanders may react. This needless to state is a wrong application. In the first place, in such cases the test should be deferred and not applied until animals are in a normal state, as even in the natural course of any febrile affection an increase in temperature might be encountered without the application of mallein and which, under mallein inoculation, may be wrongly ascribed to the injection. In the course of our work very many horses suffering from non-febrile maladies have been submitted to the test and characteristic reactions have not been obtained when they had not previously been in contact with glandered horses. Likewise in the case of febrile affections, without any previous contact with glanders, characteristic reactions were not obtained. Horses should be tested under natural and normal conditions and fed and watered as customary. Temperatures, however, should preferably not be recorded immediately after watering. Physiological increases in temperature may be induced in horses undergoing test during extremely sultry weather, if closely confined in ill-ventilated stables. During extremely cold weather they should be protected from undue draughts and chills and the body clothed if necessary. Exercise to any great extent should be withheld until the required period for recording temperature has elapsed, as any violent exercise very often perceptibly increases the temperature range. Fractious animals should also be properly restrained and controlled, so that the temperatures can be taken without undue excitability or resistance.

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During the first two years of our work, much evidence accumulated from time to time as to infection being introduced by horses coming from other countries, so that during the early part of the year 1907, in order to lessen and prevent the possibility of fresh infection being introduced into Canada, the Veterinary Director General deemed it advisable to take measures guarding against such contingencies, as a result of which the quarantine regulations were amended to conform to the general intents of his glanders policy. In the case of animals entering from the United States, it was required that all horses, mules and asses must either be accompanied by satisfactory certificate of mallein test, signed or endorsed by a duly authorized inspector of the Bureau of Animal Industry of the United States Department of Agriculture, dated not more than thirty days prior to the time and date of entry, or if not so accompanied, such animals would be submitted to the mallein test by duly authorized inspectors of the Health of Animals Branch of the Department of Agriculture of Canada. At the same time the importation of unbroken, branded, or range horses, mules and asses was prohibited and, in compliance with the foregoing regulations, in addition to the number of horses mentioned as tested in field work, we have, as already stated, tested at boundary points in Manitoba, 14,850 horses and mules coming from the United States.

In conclusion, I would state that in connection with the control of glanders in the province of Manitoba, while the number of animals which it was found necessary to slaughter during the first few years of the work, was comparatively large, the decrease became rapidly pronounced and maintained and the measures taken to prevent infections from outside sources have so far proved satisfactory. It clearly indicates that the policy of eliminating, by the use of mallein, all reactors, both latent as well as clinical cases, when put into practical operation and consistently carried out, has the desired effect of eradicating glanders, and lapse of time will only tend further to show and prove that the policy involves the least material sacrifice.

APPENDIX No. 14.

REPORT OF THE DEPARTMENTAL COMMITTEE APPOINTED BY THE
BRITISH BOARD OF AGRICULTURE AND FISHERIES TO INQUIRE
INTO EPIZOOTIC ABORTION.

PART I.

EPIZOOTIC ABORTION IN CATTLE.

Copy of Minute of Appointment and Reference to the Committee.

I hereby appoint a committee to inquire by means of experimental investigation and otherwise, into the pathology and etiology of Epizootic Abortion, and to consider whether any, and if so, what, preventive and remedial measures may with advantage be adopted with respect to that disease.

The Committee will be constituted as follows:—

Sir Edward Strachey, Bart., M.P.

The Very Rev. Dr. John Gillespie.

Professor John McFadyean, M.R.C.V.S., M.B., B.Sc., Principal of the Royal Veterinary College.

Mr. William Hunting, F.R.C.V.S.

Dr. George H. Falkiner Nuttall, F.R.S.

Mr. Stewart Stockman, M.R.C.V.S., Chief Veterinary Officer of the Board of Agriculture and Fisheries.

And I hereby appoint Professor John McFadyean to be Chairman and Mr. James Ralph Jackson, M.R.C.V.S., of the Board of Agriculture and Fisheries, to be secretary.

(Signed) AILWYN E. FELLOWES,
President of the Board of Agriculture and Fisheries.

4 Whitehall Place, London, S.W.,
April 19, 1905.

To the President of the Board of Agriculture and Fisheries.

MY LORD,—We have the honour to submit the following report embodying the principal results of our investigations concerning epizootic abortion as it occurs among bovine animals, and an appendix which gives a detailed account of the experiments and observations on which the report is based:—

HISTORY.

That the knowledge that animals may cast their young before the full period of gestation is ancient may be gathered from the reference to abortion in Genesis c. 31 v. 38, but published information on abortion which may assume epizootic characters is comparatively modern.

Flandrin in 1804 (Nocard and Leclainche) stated that the peasants were so convinced of the contagious nature of abortion that they covered up the foetus carefully and took it out of the byre through a window, so that no cow could afterwards pass over the same route.

In England the 'Complete Farmer' (1807) mentions abortion as contagious, and it has long been looked upon as contagious by many farmers in this and other countries.

In the earlier part of the nineteenth century there were amongst scientists opponents and champions of the theory of contagion. Among the former were Hurler d'Arboval (1826) in France and Youatt (1834) in England. Roloff, quoted by Zundel, in 1871 believed that abortion was due to the entrance of an infective agent by way of the vagina, and stated that a discharge from the genitals always preceded the act of abortion. St. Cyr, in 1875, believed abortion to be due to an undetermined but specific agent. Lehnert, in 1878, produced abortion in cows by putting the discharges and foetal membranes from aborting cows into the vagina. This was successfully repeated by Brauer in 1880.

1885 Nocard undertook the investigation of abortion in cows, and in the valuable report published in 1886 he brought forward excellent circumstantial evidence of the contagious nature of the disease. Nocard also submitted the disease to a bacteriological study, without proceeding to the crucial test of attempting to infect pregnant cows with his cultures. The description of the microbes isolated by Nocard (micrococci, isolated, in pairs, or in short chains; and short thick bacilli, isolated or in pairs) does not apply to the microbe isolated at a later date by Professor Bang.

In a report to the Highland and Agricultural Society of Scotland in 1889, Woodhead, Aitken, McFadyean, and Campbell showed that abortion could be produced in cows and ewes by inserting into the vagina plugs of wool contaminated by the discharge of aborting cows. A cow was also made to abort a living fetus by subcutaneously injecting her with the discharge from an aborting cow.

In 1897 Bang published the results of a very remarkable study of the etiology of epizootic abortion in Denmark. Bang examined the uterus of a cow which had been slaughtered while showing premonitory symptoms of abortion. He found 'between the uterine mucous membrane and foetal envelopes an abundant odourless exudate—a dirty yellow, somewhat thin, pultaceous material, of a slimy, somewhat lumpy character.' He also found the sub-chorial tissue of the envelopes to be very dropsical. In cover-glass preparations made from the exudate and stained with methylene blue he observed a very small bacterium, apparently in pure culture. Many of the organisms lay free, others were in dense clumps which appeared to have been formed inside cells. He described the organism as a bacillus, the body of which contained one, two, and rarely three roundish or elongated granules which readily took up the stain. The bacilli varied in length, the longest being as long as the tubercle bacillus. They were non-motile, and did not stain by Gram's method. These bacilli were also found in the contents of the foetal stomach and in blood from the foetal heart.

Bang concluded from his observations that epizootic abortion ought to be regarded as a specific uterine catarrh determined by a definite species of bacterium. This bacterium was cultivated artificially on a mixture of agar and gelatine, which was first liquefied and then mixed with half its volume of raw serum. Test tubes containing this liquefied mixture of nutrient materials were sown with the uterine exudate and immediately solidified in cold water. In these tubes growths appeared in a form which Bang described as typical of the abortion bacillus. His bacillus could not be cultivated on potato, agar slopes, serum-agar slopes, or the surface of solid serum. It grew very sparingly in glycerine broth, and slightly better in glycerine-broth-serum. In the latter material its growth could be rendered more luxuriant by replacing the air in the flask by oxygen. The peculiar and typical forms of growth described by Bang are particularly referred to and discussed in the Appendix dealing with the biology of the bacillus of abortion; they are mentioned here, however, because at the commencement of our investigation they formed the standard for identification with the bacillus of the Danish disease of any organism which might be isolated from aborting animals in this country.

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Bang in his first report also supplied experimental evidence that pregnant cows, mares, and ewes could be infected with pure artificially grown cultures of the bacillus which he had isolated.

In another paper read before the National Veterinary Association in 1906, Bang recapitulated his conclusions regarding epizootic abortion, and reported the results of some attempts to produce artificial immunity in non-pregnant animals, that is to say, before putting them to the male. The method adopted was the usual one of repeated inoculation with pure cultures of the bacillus. The experiments were on too small a scale to allow a conclusion to be arrived at, but the results on the whole were rather encouraging.

METHOD OF OBTAINING MATERIAL.

For the purpose of intimately studying the disease it was necessary to start it, and pass it from animal to animal at the laboratory. Unfortunately, from the farmer's point of view at least, there was no dearth of material, and we were able without going very far afield to purchase animals in which the act of abortion was imminent, from herds in which what we considered to be epizootic abortion had prevailed for some time. A detailed description of the animals purchased and found to be diseased is set forth in Appendix I, A (*see* Cow 12, Cow 13, Cow 14, and Cow 23).

Cow 10 was also purchased for the purpose of bringing material to the laboratory, but she aborted before arrival and was not submitted to post-mortem examination. The foetal membranes from Cow 10, however, were used for experimental purposes, and a description of her case will be found in Appendix I, C, under Experiment 1.

Through the sympathetic co-operation of the Board's Honorary Agricultural Correspondents we were put in touch with a large number of farmers in whose herds the disease prevailed. Many of these gentlemen kindly undertook at the Committee's request to forward material in the shape of aborted fetuses, foetal membranes from aborting cows, and cotton-wool swabs containing the discharges from aborting animals. In order that these materials might arrive at the laboratory in as fresh a state as possible, rubber bags in which to pack the material, and sterilized swabs of cotton-wool on which to collect discharges from the genital organs, were distributed amongst those farmers who had consented to assist us.

During the winter months a large proportion of the material arrived in a reasonably fresh condition, so that except in the summer months there was usually no lack of fresh material from the field with which to vary the stains of experimental virus. When material of this kind from the field was used for experimental infection its description will be found in the Appendix under the experiment for which it was employed. The material thus sent up was also used for other observations which will be described in the parts of the report dealing with the distribution of epizootic abortion in Great Britain (*see also* Appendix I, I).

POST-MORTEM APPEARANCE OF COWS AFFECTED WITH CONTAGIOUS ABORTION.

By consulting Appendix I, A and C, in which the post-mortem descriptions of cows obtained from infected herds in the field and those experimentally infected at the laboratory are given in detail, it will be seen that the appearances in both classes of animals were identical. The method of examination adopted was to open the abdomen of the animal immediately after slaughter, ligature the neck of the uterus, cut the organ out, and take it to the laboratory for minute examination. In no case have lesions that could be connected with abortion been found in any organ other than the uterus. The following description may be accepted as typical of a cow's uterus when affected.

Externally the organ seldom shows any departure from the normal, except that it may sometimes appear slightly more distended than one would expect for the period

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of pregnancy. Very exceptionally, however, slight œdema of the uterine wall is present in the neighbourhood of the neck. On cutting into the organ one finds between the chorion and the mucous membrane a variable quantity of exudate. It is particularly abundant around the cotyledons, and it may extend over the whole surface of the uterus and chorion, but apparently the extent of the area covered by it does not altogether depend upon the length of time the animal has been affected, as will be seen by comparing the extent of lesions found in the different experimentally infected animals described in Appendix I., C. The affected area may, in fact, after several months of infection occasionally be so small that there is a risk of its being passed over (see Appendix I., H, experiment 63, Heifer 170). Usually, however, the affected area is considerable. In one case of twin pregnancy, with a fœtus in each horn of the uterus, one horn was considerably affected, while the other was to all appearance healthy (see Appendix I., A. Cow 12).

The exudate is usually of a light brownish-yellow colour, which is possibly due to the chromogenic character of the microbe (see Appendix I., B, Culture on agar, potato, and glycerine-broth-serum (sterilized)). Sometimes, however, it is a dark chocolate colour, due probably in some cases to admixture of blood, and in other cases to the oozing of fluid from the muscles of a mummified fœtus. Its consistence varies from that of fluid pus to that of tough dough. Frequently it is so glutinous that it is difficult to remove small portions with a platinum needle. In the fluid parts one usually finds solid flocculi of varying size. If a portion of fluid exudate be placed in a test tube and allowed to stand for some hours, it separates into a lower portion of yellow solids, and an upper portion consisting of a dirty-gray liquid. When the exudate is removed from the surface of the uterine mucous membrane the latter shows no macroscopical lesions.

In advanced cases many of the cotyledons are softer than normal, and they may even be pulpy. In such cases the cotyledons have a distinctly yellow, necrotic appearance, but no sign of necrosis is to be found on examining sections of the tissue. This appearance has also often been met with in the membranes of aborted calves sent up from the field. The sub-chorial tissue of the fœtal membrane is in some cases œdematous and has an appearance very like mucoid tissue, but this change is not absolutely constant. In quite a number of cases sent up from the field portions of the chorion have been found thickened and of a leathery appearance. This lesion was also met with in one of the experimental cases (see Appendix I., C, Experiment 26, Heifer 172).

The fœtus may or may not be altered. Out of 19 fœtuses taken from experimentally infected animals seven were found in which distinct pathological changes had taken place, that is to say, in 36.8 per cent. The changes in the fœtus seem to depend upon the length of time it has been dead. Although several cases have occurred in which the fœtus must have been dead for a considerable time, in no case in the cow was the fœtus putrefying *in utero*. Apparently if the os uteri becomes open at all, the opening is shortly afterwards followed by expulsion of the fœtus. The fœtus may be quite normal in appearance, and up to time as regards development. Sometimes its tissues are œdematous, and occasionally the œdema is blood-tinged. Not infrequently the only alteration found in the fœtus is dropsy of the abdomen, or, it may be, of the chest. The umbilical cord is frequently, though not always, dropsical. Sometimes the fœtus is on the way to become mummified. In such cases the fœtal membranes are closely adherent to it, and when one separates them one removes also what is left of the fœtal skin, exposing a dark brownish-red and distorted mass of bony and muscular tissue in different stages of desiccation. Apparently it does not require a very long time for a dead fœtus *in utero* to become mummified, as in one of the experimental animals a mummified fœtus was found 138 days after infection, that is to say, probably not more than three months after its development had been arrested, assuming that the fœtus died a month after the heifer received the infective material subcutaneously (see Appendix I., C, Experiment 13, Heifer 17).

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The post-mortem appearances in ewes are, we believe, more of experimental than of practical interest, for, as will be shown in a later report, the disease as it occurs in sheep in the field is quite different from bovine abortion, although pregnant ewes can be experimentally infected with the latter.

The experience of this inquiry has been that, if ewes from one experimental lot were killed in the earlier stages—six weeks or two months—after infection, one often failed to find macroscopic lesions in the uterus, while their fellows, affected at the same time with the same material but left to run their normal course, aborted a month or less before the full term of pregnancy. Indeed, several affected ewes went to full term, when they produced live though weakly lambs, and bacilli of cattle abortion could be found in the membranes (*see* Appendix I., F, Experiments 40 and 42). When present, the lesions found in the ewe do not differ materially from those found in the cow, except that the exudate is more often of a deep chocolate colour, apparently from admixture with blood.

THE MICROBE OF CATTLE ABORTION.

Morphology.—If a suitably stained preparation made from the uterine exudate of an affected cow be examined under the microscope a large number of white blood corpuscles and catarrhal cells from the uterine mucous membrane can be seen. Between the cells there are numerous small single bacilli, which are mostly of an oval shape; some, however, are distinctly rod-shaped, like the tubercle bacillus, and show one or two unstained areas in their substance. In many places the bacilli are collected into dense groups or colonies. Some of these groups look as if they were bounded by a cell membrane, and give the impression of being contained inside tissue cells. In many cases, however, they look simply like collections of agglutinated bacilli, an appearance which it will be afterwards seen they affect in artificial culture in certain liquid media. Lying amongst the smaller elements of a colony one sometimes sees very large oval elements which take the stain very deeply.

As a rule the majority of the bacilli are between 1 and 2 microns in length, but many are less than 1 micron. The longest measure about 3 microns.

The bacilli are non-motile.

Staining.—They stain admirably with methylene blue or diluted carbol-fuchsin. They do not retain the stain when treated by Gram's method and they are not acid-fast.

Occurrence of the Bacilli in the Fœtus and its Membranes.—In no affected uterus while fresh were abortion bacilli found in the fluids contained inside the fœtal membranes. In the fœtus itself, however, they were frequently, though not always, found in the fluid contents of the stomach. (*See* Appendix I., C, Experiments 1, 3, 7, &c.)

Abortion bacilli were found in the stomach fluid of the fœtus ten times in nineteen experimentally infected cases, that is, in 52 per cent., and it will be seen by consulting Appendix I., I. that this compares in point of frequency more than favourably with the positive results obtained by examining the stomach fluid of fœtuses sent up from the field, in which only 22 out of 51 (43 per cent.) showed abortion bacilli.

In the same 19 experimental cases in cattle the abortion bacillus was never found in the fœtal heart blood, but on one occasion cultures were obtained from the heart blood of a lamb (*see* Appendix I., F, Experiment 44, Ewe 58). On one occasion only was the bacillus found in the peritoneal exudate of the fœtus (*see* Appendix I., Experiment 1, Fœtus 22).

In stained preparations from the mucus present in the fœtal stomach one sees squamous and columnar cells shed from the mucous membrane. Large colonies of the abortion bacillus are seldom met with in this material, but one may see considerable numbers of the single rod elements.

Cultural Characters.—For the purpose of obtaining pure cultures the custom was to thoroughly sear the surface of the intact uterus, open into it with a sterilized knife,

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and extract the exudate by means of a sterilized platinum scoop. It is from the exudate that the best cultures are obtained. One can, however, also obtain cultures from the contents of the foetal stomach. For the collection of the latter material the surface of the foetal stomach was seared, and its wall pierced by sterilized glass pipettes, into which the fluid was aspirated. Keeping in mind the characters assigned by Professor Bang to the bacillus isolated by him from affected cows in Denmark, we attempted in the first instance to obtain cultures on the artificial media—agar-gelatine + raw serum, and glycerine-broth + raw serum—which he stated to be essential for the cultivation and identification of his organism. According to Bang, when tubes containing agar-gelatine + raw serum are sown with uterine exudate, and incubated, one finds 'at the end of from two to four days a great number of very small colonies, which develop only in a definite zone of the tubes. This zone lies half a centimetre (about $\frac{1}{2}$ inch) under the surface of the nutritive medium, and it has a thickness of from 1 to $1\frac{1}{2}$ centimetres ($\frac{2}{3}$ to $\frac{3}{4}$ inch). Colonies are not present either above or below this.' Professor Bang goes on to say in this connection, 'We had thus not to do with an aerobic bacterium, which would have pushed its growth as far as the surface of the nutritive media, and still less had we to do with an anaerobic form, which would have grown as far as the bottom of the tube. The under-limit of the zone of growth lay exactly where the limit of the growth of an anaerobic bacillus shows itself (the necrosis bacillus, for example). This highly peculiar behaviour of the abortion bacillus towards oxygen made it at once apparent that we had to do with a distinct species, and therefore rendered it in the highest degree probable that there was a causal connection between the bacterium and the disease.'

Obviously the peculiar mode of growth which has just been mentioned greatly facilitated our further studies, as we were thereby enabled to recognize the specific bacillus even when it was present in very impure cultures. The colonies are very small, even punctiform, the largest scarcely attaining the size of a pin's head. Their form is roundish, and when slightly magnified their edges seem to be finely dented.'

When describing later the behaviour of his bacillus in liquid cultures—glycerine-broth-serum (raw)—Bang further stated that the growth could sometimes be rendered more luxuriant by bubbling a large quantity of oxygen through the fluid and afterwards sealing the mouth of the flasks. In speaking of the biological characters of his bacillus, he stated that his observations 'appeared to show beyond any doubt that for the abortion bacillus in its behaviour towards oxygen there are two optima—first, a degree of oxygen tension in the nutritive medium less than that of the atmospheric air; and second, the presence in the nutritive medium of a very high oxygen tension, which, however, lies somewhat under 100 per cent. Between these two optima there is an intermediate zone in which the abortion bacillus grows badly or not at all.' Further, he stated that with the Danish bacillus the growth in glycerine-broth was meagre, and he apparently failed to obtain any growth on the surface of agar or on potato.

We have thought it necessary to quote the above description at length, because the cultural characters of the bacillus were stated to be specific, and to constitute a standard whereby one might recognize the organism of the Danish disease, and because failure to obtain the typical cultures above described when working with the exudate found in the English disease was almost invariable. Further, the bacillus which was isolated and proved to be the cause of cattle abortion in England exhibited many other biological characters different from those described by Bang in connection with the Danish bacillus. Indeed, those differences were so material that, although we were convinced from the start that we had met in the uterine exudate, at least, with the same organism as that described by Bang in Denmark, resort had frequently to be made to experimental tests on pregnant animals in order to prove that the apparently different forms of organism which we had isolated in artificial culture were capable of producing abortion.

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Agar-gelatine-serum (raw).—On agar gelatine-serum (raw), it was almost invariably found that the growth began as a gray circular cloud almost immediately below the surface of the medium, or the first appearance of growth consisted of a large number of very small isolated gray specks in the thin film of medium on the surface at the circumference of the tubes. The gray sub-surface cloud very speedily spread to the top, especially if some liquid had been expressed from the medium in the cooling process. Very frequently, too, it was found that the first growth appeared in the expressed surface fluid, if such existed. Distinct macroscopic colonies only appeared in the sub-surface layer of the medium, that is to say, below the grayish ring, after a week or more. Frequently, even when there was no surface fluid present, the growth would extend over the surface of the medium as a thick dirty-white layer. Moreover, it was found that certain microbes which were undoubted impurities would sometimes give a growth very similar to that described by Bang as occurring in this medium. Notably, did it occur to our astonishment that the tubercle bacillus isolated from the uterus of Cow 23 (see Appendix I., A) gave a growth absolutely identical with that described by Bang as typical. In fact, from a pictorial point of view it was the most typical growth obtained. Again, it was found that a totally different microbe which was isolated from sheep in the field, and which has been proved to cause abortion in that species, may and frequently does, give a growth almost identical with that described as typical of the Danish bacillus of cattle abortion.

Very occasionally it was found that the growth of the abortion bacillus would begin nearly a quarter of an inch below the surface, that is to say, very nearly in the anaerobic layer of the tube. In these exceptional cases the growth would not show until after about ten days' incubation. Never was a growth of colonies throughout the medium obtained except when undoubted contaminations were present, and we think that such an appearance in a tube may be taken as a certain sign of the presence of impurities.

This medium (agar-gelatine-serum) for various reasons was found difficult to manipulate, and as it did not seem to have any specific qualities it was discarded, except for the purpose of special observations (see Appendix I., B). It was also discovered later that a solid medium with all the advantages, such as they are, and none of the disadvantages, of the above, could be prepared by adding to the agar-gelatine a similar proportion of serum which had been diluted, alkalinized, and sterilized at a high temperature. Tubes of solid media prepared in this way could be sterilized in the autoclave without the serum undergoing coagulation. In the solidified condition they can be kept in stock, and they can be liquefied when necessary by simply heating the tubes in a Bunsen flame (see Appendix I., B, Glycerine-broth-serum sterilized at high temperatures, and agar-gelatine-broth + raw serum).

The individual sub-surface colonies vary in size from a pin's point to the head of a large pin, but, of course, the larger ones develop at a later period. The smaller colonies are grayish in colour, but as they increase in size their centres become of a distinct rusty brown. In outline they are circular, and in many cases the margins are dentated. The most distinct character of the abortion bacillus grown in this way is the appearance of the larger colonies, which have a brownish centre, gray outer part, and dentated edge.

Agar.—On the surface of agar excellent growths of the bacillus were obtained. In order to get such a growth from the uterine exudate one must incubate the tubes for 10 days or more, and for that reason the suitability of this medium was at first overlooked. One can, however, obtain excellent growths on the surface of agar in two or three days by sowing with the culture in the top fluid expressed on the agar-gelatine-serum tubes. After one or two changes from smear to smear these surface cultures grow more luxuriantly. At the first growth appears in the form of tiny dewdrops. If the material used for sowing has been only moderately rich in

organisms, the colonies grow in an isolated manner on different parts of the surface. As they increase in size they develop a faint bottle-green colour, which after a time takes a distinctly yellow, and sometimes a brownish, tint. If the seed material has been rich in organisms a dewy film appears all over the surface. This film also takes on the faint bottle-green tint, and may become yellow or even brown, while a dense grayish deposit of microbes forms in the water of condensation at the bottom of the tubes. At first, as already stated, on account of the apparently great difference between this manner of growth and that of the microbe isolated in the case of the Danish disease, we were inclined to look upon these surface growths as contaminations. That they are cultures of the abortion bacillus cannot be doubted, however, as will be seen later.

Plate Cultures.—Plate cultures can also be obtained on the above solid media contained in flat bottles, such as Soyka's flasks, by liquefying the material, allowing it to cool to between 40° and 45° C., sowing it with exudate or culture, shaking the material through the medium, and then allowing the latter to solidify while the flask is laid flat. For plate cultures, however, plain agar is not so suitable as the agar-serum mixtures. In plate cultures colonies of abortion bacilli appear first throughout the sub-surface layer like brownish-gray specks of bran, and as the colonies increase in size many of them show the reddish-brown centre, gray outer part, and dented margin. In such flasks there is always a certain amount of condensation fluid. The growth may soon appear in this, and ultimately spread over the surface. Some of the sub-surface colonies extend to the top of the medium, and grow quite luxuriantly on the surface. For obtaining pure cultures of the abortion bacillus from contaminated material the plate method has not been found useful, because the bacillus grows much more slowly than most of the contaminations, and the latter speedily cover the surface of the medium, obscuring the abortion colonies or preventing their growth.

Gelatine.—Gelatine was found useless for the cultivation of the abortion bacillus. It is unsuitable, not only on account of the low temperature at which it has to be incubated in order to preserve solidity, but also apparently from its composition, since the bacillus hardly grows at all even when the gelatine is kept in the fluid state at 37° C.

Potato.—At first it appeared as if potato was useless for the cultivation of the English bacillus, as it had apparently been found to be for the Danish organism. It is not easy to start cultures on potato from the exudate, but it was found to be a most excellent medium for obtaining sub-cultures. No growth, however, is apparent until the tubes have been incubated from seven to ten days, or even longer. The growth begins as a honey-coloured layer, which soon changes to a deep chocolate colour like that seen in cultures of the glanders bacillus. The bacillus of cattle abortion, then, is chromogenic. After a month the layer of growth is very dense.

Glycerine-broth + raw Serum.—This is the medium which was used for the purpose of obtaining liquid cultures of the microbe causing the Danish disease. Cultures of the bacillus which was isolated in connection with the English disease were also obtained in this medium, but it was discarded, except for special observations, because of the difficulty of getting large quantities of serum in a sterile condition for culture purposes, and of the facilities which arise for the contamination of tubes and flasks when raw serum has to be added to them. It was found that if glycerine-broth be mixed in equal proportion with diluted alkalized serum sterilized at a high temperature (see Appendix I. B), one obtains an equally good and much more convenient liquid medium. Further, if one per cent. of grape sugar be added to this medium the abortion bacillus grows much more luxuriantly than in any of the others previously mentioned. Flasks or tubes of this medium may be sterilized in the autoclave, and if sown with abortion bacilli and incubated under ordinary aerobic conditions a very luxuriant growth develops. The method of replacing the air in the flasks by bubbling

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filtered commercial oxygen through the liquid for a more or less prolonged period, and then sealing the neck of the culture flasks, does not increase the luxuriance of the cultures. The method, moreover, has many disadvantages. For example, it increases the facilities for contamination, and it renders the flasks liable to burst in the incubator after a period of incubation, because the abortion bacillus in the process of cultivation uses up oxygen, and creates a more or less considerable vacuum inside the flasks. Even if a flask be sown heavily in the ordinary way without replacing the air by oxygen, and the neck be sealed, there is considerable danger of its collapsing inwards owing to the absorption of oxygen by the bacilli from the contained air.

In the liquid serum medium the first growth appears in the form of a gray precipitate. Later on, little yellow and gray flocculi collect at the bottom of the flasks or tubes. The flocculi are more abundant in the raw serum mixtures, especially when sown with exudate.

Peptone-broth.—This is not a good medium for obtaining a first culture from natural material, such as exudate, but a fairly good growth is obtained in peptone broth if it be sown with material from agar slopes. If one per cent of grape sugar be added to the broth the growth is greatly improved, but it is always inferior to that obtained in the glycerine-broth-serum mixtures sown in the same way. In broth made from liver it also grows fairly well.

Milk.—Very good growths of the abortion bacillus were obtained in sterilized milk, but this cannot be considered a useful or convenient medium. Attempts were made, without success, to keep a culture of the abortion bacillus going inside the mammary gland of a milch cow. A pure culture can be injected up the teat of such an animal without causing mammitis, but it was not possible to find abortion bacilli in the milk a week after the injection had been performed.

Physical Requirements.—The abortion bacillus grows best at temperatures between 30° and 37° C. One cannot start a culture outside the incubator, but if actively growing cultures on solid media be incubated for a few days, and then taken out, the growth seems to increase slightly at the temperature of the laboratory.

The bacillus is an aerobe, that is to say, it requires oxygen for its development. It will, however, grow fairly well in a rarefied atmosphere containing very little oxygen, but it will not grow under anaerobic conditions. In fact, one can destroy the vitality of an active culture by putting it in the incubator at 37° C. under anaerobic conditions for two or three days (see Appendix I., B., Physical Requirements).

Microscopical Appearance of Cultures.—The microscopical appearance of cultures varies greatly, according to the medium from which the preparation has been made, and the seed material from which the culture has been obtained. In preparations made from media containing a large proportion of raw serum (one-third) one finds the microbe growing in clumps, no matter what material has been used for sowing, giving an appearance which might be described as that of staphylo-bacilli. The clumping is particularly evident when the medium has been sown directly with uterine exudate. Some of the clumps in the latter case may be seen to contain as many as a hundred elements.

Through the kindness of Professor Bang we have on several occasions received liquid cultures (in raw serum media) of the Danish bacillus from his laboratory for comparison. These always showed small clumped forms, and at first gave the impression that this was the specific form of growth. If preparations be examined from the heated liquid serum media the appearance is the same, provided the culture has been obtained by sowing heavily with natural material. It is otherwise, however, if sub-cultures on heated serum be made from the first culture, or if the flasks be sown from agar smears or other cultures on solid media. In this case one sees nothing but single bacilli, which very much resemble the individual elements of the clumps, but no clumps are present. In hanging-drop preparations no movement is observed. If preparations be made from agar smears or from the top growth on agar-gelatine-

serum (heated), only single elements can be seen, and no clumps are present, although, of course, in such preparations the organisms may be densely packed.

These distinct departures from the characters described as typical for the bacillus of the Danish disease again suggested that possibly a different microbe, and one which was not the cause of abortion at all, had been isolated. It was found, however, that if the raw serum medium was inoculated from an agar slope or other clumpless culture the bacillus grew again in the clumped form. Moreover, if raw serum was added to a clumpless liquid culture in sufficient quantity (about one-third of its bulk), the latter after standing was transformed into a typical clumped culture, and it seemed highly probable that the clumped appearance of the cultures in raw serum was simply due to the natural agglutinating power of the serum. This agglutinating power was, of course, destroyed by the sterilizing temperature, with the result that the organism grew in the unclumped form in the heated serum medium. The exudate, however, also contains agglutinating substances, as may be gathered from the clumped appearance of the organisms in the exudate obtained directly from the uterus, and when heated serum is heavily sown with this material it gives rise to agglutination or clumping of the bacilli.

It was also found that whatever form of culture was used for inoculating agar smears the growth on the latter was always the same as that previously described. Finally it was established by experiment on pregnant animals that the agar smear cultures were those of the abortion bacillus (see Appendix I, H, Experiment 63, Heifers 170 and 171).

As previously mentioned, we have been indebted to Professor Bang for kindly sending cultures of the Danish microbe for comparison. From one of those received towards the end of this part of the investigation it was found possible to obtain surface growths on agar and the other apparently atypical growths which had been found to be characteristic of the microbe which was isolated in England. There seems no reason to doubt, then, that the Danish and English diseases are one and the same, and we have not thought it necessary to coin a name for the bacillus, as it seems appropriate that it should be known as 'Bang's Bacillus of Cattle Abortion' in deference to the work of its distinguished discoverer.

Thermal Death-point.—Several observations have been made on the temperature necessary to destroy the vitality of the bacillus of cattle abortion (see Appendix I, B, Thermal death-point). It was found that in the moist state it was not destroyed at a temperature of 55° C. maintained for an hour, but two hours at the same temperature proved fatal. If it be kept for ten minutes in water at a temperature between 59° to 61° C. and above, its vitality is destroyed, but after exposure in water at 55 degrees for ten minutes it retains its vitality.

Formation of Toxins.—When the bacteria were removed from an actively growing culture by filtering through a Chamberland filter it was found that one could inject large doses of the filtrate into animals without giving rise to any notable disturbance. (See Appendix I, B, Tables I. and II.)

Apparently there is no appreciable formation of soluble toxins in the cultures. When an animal is inoculated, however, with a comparatively large amount of liquid culture or exudate a distinct febrile reaction may follow in a few hours (see Experiments 13 and 14, Heifers 17 and 51). Occasionally distressing symptoms of dyspnoea may follow immediately (see Experiment 26, Heifer 172). Such symptoms are more likely to arise when an animal is inoculated for the second time after an interval of about ten days. Apparently, then, toxins are developed, but they are of the nature of endotoxins, that is to say, they are contained inside the bodies of the bacilli. Moreover, it would appear that the toxins are not completely destroyed by a high temperature (100° C.), since the inoculation of a sufficient dose of bacilli so heated may cause a febrile reaction in affected animals, and even in normal ones, but to a less extent (see Appendix I, I, Diagnosis).

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VIRULENT MATERIAL AND ITS VEHICLES.

The contents of the infected uterus, that is to say, the exudate, the foetal membranes, and the foetus, are all virulent, since they contain the microbe. As long as the affected uterus remains closed these materials are inoperative so far as other animals are concerned, but once they have been expelled they become dangerous. The discharge which comes from the genital organs for a varying period after the act is also virulent (consult Experiments 7 and 18, Heifers 5 and 41). It is possible that the dung of an animal which has ingested infective material may be virulent for a time, but it seemed very unlikely that this question could be answered by the results of a few experiments. It is improbable that abortion bacilli are excreted in the milk of affected cows, and some experimental observations which were made show that the bacilli cannot be found in the milk a week after a large amount of culture has been injected up the teat.

The length of time during which the virulent materials may remain infective outside the animal is of considerable importance. By reserving this subject for the later stages of the investigation a good many laborious and costly experiments on animals were rendered unnecessary, because it was found that actively growing cultures could be obtained from exudate which has been stored in fluid for six and seven months, and such cultures were used successfully to infect animals for another purpose (*see* Heifer 49, Experiment 25; Heifer 172, Experiment 26; also Heifer 113, Experiment 27). In the case of Heifer 124 (Experiment 30), exudate from Heifer 17, which had been stored in bulk and kept in a cool room for 365 days, and which was still semi-fluid and non-putrid, failed to infect. The exudate from Heifer 17 was originally virulent, as it infected Ewes 85 and 84 (*see* Experiment 40).

It appears, then, that virulent material may, if kept fluid and free from putrefaction, remain infective for seven months but not for a year. Observations for the purpose of determining more exactly the period between seven months and a year at which it is no longer possible to obtain cultures from exudate stored in fluid are still going on.

We think it is in the highest degree improbable that the microbe propagates outside the animal body; but the advantages from a hygienic point of view derivable from its non-saprophytic characters are largely counterbalanced by the length of time infective material may preserve its virulence outside the animal body.

Desiccation has a destructive influence on the vitality of the virus. The exudate from Heifer 113 (*see* Experiment 27), which was very rich in the bacilli of abortion, was dried in a rarefied atmosphere over chloride of calcium at a temperature of 37° C. for three days. After drying it was finely powdered in a sterile mortar, placed in a sterile test tube, and stored in a dried atmosphere for four months. One gramme of this powder dissolved in broth failed to infect Heifer 130 when administered by the veins (*see* Experiment 31). Under natural conditions, however, exudate takes a long time to dry, for a hard crust forms on the outer layer and protects the inner ones. A small quantity may be quite moist two months in the laboratory.

Once the contents of the uterus have been expelled the virulent material may be carried to other parts of the cowshed along the surface drains. Infective material may be transported long distances in the soiled manure, on the coats of the aborting animals and their companions, and on the hands and boots of attendants. When carelessly disposed of, it may contaminate the water supply. Dogs may carry a portion of an aborted foetus or membranes to other parts of the farm or to neighbouring farms. When an animal has aborted at pasture the virulent material may be taken considerable distances by foxes. It follows also from Experiment 48, Bitch 6, that pregnant bitches and vixen may become infected by eating virulent material, and by afterwards aborting furnish another means of keeping up and spreading virulent material.

Affected in-calf cows may be introduced into a clean herd, and be the means of establishing fresh centres when they abort; this is one of the most insidious ways in which abortion may be spread, for it is impossible for the ordinary individual to say whether a pregnant animal is affected or not.

Cows which have aborted must be considered sources of infection so long as the discharge continues to come from the genital organs, and it may continue intermittently for a few weeks if the animals be not treated. Such animals, if not isolated, may continue to infect the sheds, or the pastures when turned out to graze. Moreover, we understand on good authority that it is a prevalent custom to dispose of cows which have aborted rather than risk breeding from them again. It is to be noted also that cows may discharge a day or two before aborting (*see* Heifers 5 and 7, C). The question whether or not a cow which has aborted and become pregnant again is likely to infect a new establishment, when removed thereto, if bought from a market for example, will be dealt with in the section of this Report relating to methods of infection. The bull as a source of infection will also be discussed under the same section.

METHODS OF INFECTION.

The most certain method of infecting an animal with abortion is to inject natural virulent material or active cultures into the blood stream. By consulting Table VII. (Appendix I., C) it will be seen that this method of infection gave positive results in eight cases, and failed in none. It is not, of course, to be taken as a natural method of infection, but it is of the greatest use experimentally for the purpose of testing cultures and immunity, and for infecting animals for subsequent observations on methods of treatment; in fact, it is particularly useful for all cases in which one wants to make absolutely certain of obtaining infection for experimental purposes.

Animals can also be infected by the subcutaneous inoculation of considerable quantities of virulent material. By consulting Table VI. (Appendix I., C) it will be observed that out of five attempts to experimentally infect animals by this method three were positive, and two were negative. We consider that this method of infection must be looked upon as an artificial one, and we do not think it probable that under natural conditions animals are at all likely to be infected by virulent material gaining access to a wound. As an experimental method of insuring infection it is much inferior to intravenous inoculation.

Coming to the natural methods of infection, there are two ways in which the virulent material may gain access to the pregnant uterus, viz., by the vagina and by the mouth. Table IV. (Appendix I., C) shows that by introducing virulent material *per vaginam* five positive and three negative results were obtained. Table V. shows that by ingestion three positive results were obtained against one negative. We do not think it would be warrantable on this comparatively small number of experiments alone to conclude that infection is more likely to follow when virulent material is swallowed than when it is introduced by the vagina. With regard to infection by the mouth, however, it is a natural method of infection which until recently did not enter into anybody's calculations regarding the spread of abortion, and knowing as we do that the food, including the pastures, and even the feeding trough, may more or less easily be contaminated on an infected establishment, it seems highly probable that infection by ingestion often takes place. In fact, we are inclined to believe that the disease is more frequently contracted in this way than in any other. Presumably, the bacilli are absorbed from the intestine, and gain the blood stream, whereby they reach the uterus. In the case of Ewe 77, the microbe of cattle abortion was found in the cotyledons six days after infection by the mouth (*see* Experiment 42. Appendix I., F).

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Infection by the vagina has always been supposed to be the most frequent natural method, partly because it is thought that the gutter which in most cowsheds runs behind cows standing in line often brings the discharges from an aborting cow in contact with the tails and external genital organs of her companions. In considering the relative importance of infection resulting from the more or less accidental admission of infective material from the floor or dirt of the cowshed, it must be borne in mind that, even when discharges from an infected cow do reach the floor or become mixed with the excreta in the channel behind the cows, the chances must usually be against the bacilli gaining entrance to the genital passages, and that the number of bacilli which could be so admitted to the vulva or vagina under ordinary conditions must generally be small. In the experimental attempts to infect with natural virus by way of the vagina (see Appendix I., C), three were followed by positive results and three by negative, in spite of the fact that the material was deposited in enormous quantity right on and around the os uteri by means of a long tube.

Infection by the Agency of the Bull.—This must be viewed as a special form of infection *per vaginam*, since it is supposed that the bull, by means of his penis, transfers the bacilli from the vagina of one cow to that of another. There are *a priori* reasons which compel one to admit that such an occurrence is possible, and there is a certain amount of circumstantial evidence to show that in particular cases in actual practice the disease has been spread in that way.

We have scarcely been able to approach this question from the experimental side (see Appendix E.), and for the following reasons:—It is obvious that in order to test the ability of a bull to transmit the disease each experiment must be planned so that a diseased cow with her genital passages still infected and a healthy cow shall be served in succession, and with only a short interval, by the same bull. But, owing to the moderate number of diseased and healthy animals at our disposal, we never had available for experiment a recently aborted cow and a healthy heifer which were both in oestrus on the same day. In one experiment of this kind (see Appendix E., Heifer 125), an interval of 13 days elapsed between the service of the cow which had aborted and that of the healthy heifer. The result of the experiment was negative, but little importance can be attached to the fact, (1) because the interval between the two services was too long, and (2) because a single experiment with a negative result carries very little weight.

It has to be observed that, with the discovery that infection can readily be brought about by ingestion of virulent material, most of the circumstantial evidence which seemed to establish the bull as a factor of the first importance admits of another and more probable interpretation. For example, it was held that when heifers which had never been in the infected byres aborted at pasture they must have been infected by the bull, but in such cases we are now in a position to say that if recently aborted cows have grazed on the pastures the heifers may have been infected by swallowing grass or water contaminated by the discharge from the genitals of the former, or that virulent material may have been conveyed on artificial food stuffs from the buildings. Without denying that the disease may sometimes be spread by coition, we think that nothing more than a quite subsidiary rôle in the spread of epizootic abortion can now be assigned to the bull.

This section of the report would hardly be complete if we omitted to discuss the probability of the persistence of the bacilli in the womb of a cow which has aborted until the date of the next pregnancy. The point will be discussed in another light under the section dealing with natural and acquired immunity, but we may again refer here to Experiments 32, 33 and 34 (E), in which none of the animals which had previously aborted were infected at their next pregnancy, and we may also direct attention to the case of Heifer 173 (Experiment 63, Appendix I., K.), in the uterus of which no abortion bacilli could be found a month after she had aborted. One cannot,

however, pass over the undoubted fact that in practice some cows abort twice, and even three times, in succession; but it does not follow that they do so owing to the persistence of abortion bacilli in their organs. It is at least possible that, not having acquired immunity, and being on infected establishments, as such cases usually are, they have been reinfected.

It is highly improbable that abortion bacilli remain for a long time active in the bodies of non-pregnant animals. The experiments on immunization (Appendix I, J., Heifers 167 and 168) supply a certain amount of experimental evidence against the view that the bacilli remain active in such animals. Heifers 167 and 168 each received 125 c.c. of culture subcutaneously. The former became pregnant 148 days and the latter 106 days afterwards, and one might fairly have expected them both to have become infected from the inoculation had the bacilli remained active in the body.

SYMPTOMS.

If the details of the various experiments recorded in Appendix I, C. be consulted, it will be seen that in the animals which were infected by natural methods, and with what in a sense approaches natural quantities of infective material, no symptoms indicative of disease followed immediately upon infection. It is true that in some of the animals which were infected with considerable doses of virulent material by unnatural channels, such as subcutaneous and intra-venous inoculation, febrile symptoms followed infection, and in one case at least intra-venous inoculation was followed almost immediately by severe toxic symptoms (*see* Experiment 26, Heifer 172), but it may be taken that under natural conditions infection is insidious, and that no noticeable symptoms arise until the animal is about to abort. Even when enormous quantities of exudate or culture are injected into the vagina no local symptoms, such as catarrh or inflammation, follow.

The course of the disease is as a rule slow. In ten experimentally infected animals which aborted, or which were killed when showing unmistakable symptoms of abortion, the average period between infection and the act was 126 days. The shortest period in any of these animals was 33 days, and the longest 230 days. The average period of pregnancy at which abortion took place was 195 days, the earliest 149 days, and the latest 254 days; but it should be pointed out that one can hardly draw any inference applicable to practice from the observations regarding the period of pregnancy, because most of the experimental animals were infected at different stages. There is also good reason to believe that in an animal infected at a late date, and less frequently in one infected in the earlier stages of pregnancy, a premature birth may occur at a period so near the full time that it might not occur to the mind of an ordinary owner that the birth was not normal.

In four of the above mentioned 10 animals no premonitory symptoms of abortion were observed, but, as the act took place in two of the four cases during the night, it is possible that there may have been premonitory symptoms for a few hours. In six out of the 10 cases distinct premonitory signs were noticed for periods extending from a few hours to three days in one case and two days in another. One of the first symptoms observed is that the animal 'makes a bag,' that is to say, the udder swells rather suddenly. In fact, in heifers about to abort in the later stages of pregnancy one may find that the gland has become functional a month or more before its time. The animal becomes uneasy, stamps its feet, and, if in a loose box, moves restlessly about. The vulva is, slightly swollen, and the ligaments are somewhat relaxed. At intervals, quantities of mucus, which may be blood-tinged, and later a yellow discharge, come from the vulva. These discharges soil the tail of the animal, and they may even be found on the floor of the stall behind her. In the case of animals aborting in the earlier stages the fetus may come away completely enclosed in the membranes. In the later stages, however, the membranes may be retained in the whole

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or part, and the retained portions are very difficult to remove with the hand. Their presence gives rise to the well known complications following upon retained placenta. After the act of abortion a thin yellowish discharge continues to come from the genital organs for several weeks, and this condition is maintained for even a longer period when the placenta has been retained. It would appear that in cases where the foetus and its membranes are completely expelled contraction of the uterus may take place in a few hours (*see* Appendix I., C, Experiment 15, Heifer 4).

It is to be noted that one must not always accept slight swelling of the udder, accompanied by restlessness and even a small rise in temperature, about the fifth or sixth month of pregnancy, as evidence that the animal is going to abort, because such symptoms may be observed in perfectly healthy animals.

DISTRIBUTION AND IDENTITY OF THE DISEASE.

In the absence of an order requiring the disease to be reported, it is not possible to obtain an exact idea of the extent to which epizootic abortion in cattle prevails throughout Great Britain. We are in a position to state, however, that it is very prevalent. By the co-operation of the Honorary Correspondents of the Board of Agriculture and Fisheries, and many stockowners throughout Great Britain, we have been put in touch with a great deal of valuable material, which has enabled us to establish by examination the existence of epizootic abortion of cattle on 55 farms in 36 counties (*see* Appendix I., I).

We have not in the course of our investigations met with any epizootic abortion in cows which was not due to the bacillus of abortion. We do not deny that odd cases of abortion may rise from accident or poisoning by such substances as lead, but we have no hesitation in stating that we believe that at least 99 per cent of the outbreaks of cattle abortion which assume epizootic characters are due to infection by the bacillus of cattle abortion, and that the fact of a cow having aborted on premises formerly believed to be clean is a sufficient reason for suspecting that the disease has been introduced.

We desire to add to this statement that, if the case be inquired into without delay after an animal has aborted, there will be very little difficulty in arriving at an accurate diagnosis (*see* this Report, Diagnosis, and Appendix I., I.)

SPECIES OF ANIMALS WHICH ARE SUSCEPTIBLE.

At the commencement of this investigation it seemed not improbable that epizootic abortion of the different domesticated animals might be one and the same disease. This view appeared to have support when it was found in the laboratory that with the infective material of cattle abortion—uterine exudate and artificial cultures obtained therefrom—pregnant females of most of the other domesticated species could be experimentally infected.

Reference to Appendix I., C and F will show that abortion was experimentally induced by introducing the microbe of cattle abortion into the bodies of cows, ewes, goats, bitches, and guinea pigs. A single experiment on a pregnant sow gave a negative result. This experiment has been repeated, but we have not thought it necessary to delay this part of our report for the further result, and we think it highly improbable that the sow is naturally immune, in view of the susceptibility of other species. As regards the mare, we have done no experiments at the laboratory, but a small number of observations have been made in the field and laboratory which go to show that the equine disease is not caused by the bacillus of cattle abortion. It may be mentioned, however, that Bang has successfully infected many with the latter microbe. Notwithstanding the probability, it would have been rash to conclude definitely that, because the various species of domesticated animals can be infected with the bovine bacillus in the laboratory, that organism is responsible for outbreaks

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of abortion among such species in the field. We have not accepted even the bovine bacillus as the cause of epizootic abortion in cattle on the evidence of laboratory experiments alone, but have added to it direct evidence from the field (*see* Appendix I., A and I).

As already mentioned, the field observations make it probable that the bovine bacillus is not responsible for abortion in mares. With regard to sheep, we have never succeeded in finding the bacillus of cattle abortion in the membranes of ewes aborting in the field, although much material has been examined; nor have we ever found it in the uteri of ewes from aborting flocks, even when the animals were killed while showing premonitory symptoms. Further, a totally different microbe—a vibrio—has repeatedly been isolated from outbreaks in ewes, and has been successfully employed at the laboratory to experimentally infect other ewes which had been tupped at the laboratory and were pregnant for the first time. Pregnant cows, however, cannot be infected with this vibronic abortion of ewes, and the sheep disease will be the subject of a later report.

We are of opinion that bovine abortion, which is the subject of this first report, is essentially a disease of cattle, and although other species can be experimentally infected in the laboratory they are not likely to contract the disease in practice except as the result of gross carelessness in the disposal of infected material. Although it is hardly germane to the present inquiry, we think it advisable to point out that, since the bacillus of cattle abortion is pathogenic for so many species, the possibility of the human female being infected should not be lost sight of.

DIAGNOSIS.

It is an easy matter to identify the characteristic clumps of abortion bacilli (*see* Appendix I., A and C) in microscopic preparations made from the uterine exudate discharging immediately before and after abortion. The exudate can be collected from an aborting animal on swabs of cotton-wool for transmission to the laboratory (*see* Appendix I., I), or smears can be made on glass slides for examination later. The most reliable material to send away for diagnosis in the laboratory is the fresh foetal membranes, but the contents of the foetal stomach may also contain the microbes. The placental cotyledons from a cow affected with epizootic abortion often have a yellow bleached appearance, and the characteristic clumps of bacilli can almost invariably be found and identified with the microscope in material scraped from their surface, even when putrefaction has begun and the material swarms with other microbes (*see* Appendix I., I).

The problem of diagnosis, however, was not completely solved by establishing a reliable method of recognizing epizootic abortion after the act. As already explained, the disease runs a chronic course without symptoms, and although animals are infected a considerable time before aborting they only become infective for other animals during and after the act. The importance, then, of obtaining a method whereby the disease may be diagnosed before the act is obvious. To this end, the agglutinating power of the serum of affected animals as compared with that of healthy ones on cultures of the bacillus was studied, but, although it is not without value in epizootic abortion, the agglutination test cannot be regarded as free from great risk of error (*see* Appendix I., I, Agglutination Test).

'Abortion.'—A material analogous to tuberculin was prepared from cultures of the bacillus of cattle abortion. When this substance is injected into the veins or under the skin of an affected animal a temperature reaction generally follows, commencing at the fourth hour after injection and lasting usually until the fourteenth hour. Intravenous injection, however, may also be followed by very alarming systematic symptoms of the nature of anaphylaxis, and characterized by rapid breathing, dyspnoea, the flowing of saliva from the mouth, rigors, and straining. The

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intravenous method is not without danger, and would probably be objected to in practice on account of the alarming reaction it may give rise to. The subcutaneous method has not been followed by similarly alarming symptoms, but a larger dose— $\frac{1}{2}$ to 1 c.c.—of the crude abortin has to be injected.

The injection of abortin to normal animals may be followed by a temperature reaction, but in the observations so far made on animals whose complete history was known—those of the laboratory—the temperature of normal ones did not rise in any case above 103.6° F., whereas in the affected it rose to 104°-105° and 106° F., and even higher. (Compare Tables XIV and XVI, Appendix I, I). Animals which had aborted reacted to abortion for months afterwards, and a similar reaction was obtainable for a like length of time from animals which had received intravenously a dose of living culture, even if they were not pregnant. Animals which were immunized, and afterwards intravenously inoculated to test their immunity, also gave a reaction, although at the time they were not infected (see Appendix I, I, Table XIV., Heifers 167 and 168). One animal which was infected intravenously, and afterwards successfully treated, also reacted (Table XIV., Heifer 187), while one which was infected by the mouth, and was afterwards successfully treated, gave a reaction before treatment, but ceased to react after treatment (Table XIV., Heifer 190). Heifer 172 did not react to the first test, but reacted to a second 63 days later (Table XIV.).

An observation which was made on a portion of an infected herd in the field is of particular interest. The animals of this herd are those designated as 40, 89, 51, 84, 70, 109, and—14, 7, 41, 62, 66, and 87 in Table XV. (Appendix I, I). The first six had aborted at various dates before the test, and they all reacted except 51; the second six were pregnant cows selected haphazard from the others, and of these two reacted and four did not. There has not been time yet to verify the result of the test in the two pregnant reactors, but the great frequency, if not constancy, of the reaction in the tested animals which have aborted, and in those which were known to have been experimentally infected at the laboratory, makes it highly probable that the reaction is a specific one.

The abortin test is now being tried on infected herds in the field, and the results will be reported when they have matured. This will, of course, require some time, as the period of pregnancy in the cow extends over nine months, and it will not be possible to judge of each test until the animal has either aborted or calved normally.

'Complement Test.'—The observations which are recorded in the Appendix (I, I) hold out a strong hope that the method of diagnosis based upon what is termed 'fixation of the complement' may prove to be reliable for the diagnosis of epizootic abortion even in its early stages. The actual technique of this method is a little complicated, but the test depends for its success on the fact that the abortion bacilli, although themselves confined to the uterus, manufacture a substance which passes by absorption into the circulating blood, in the serum of which it can be detected by a highly specific character, namely, its affinity for abortion bacilli.

The majority of the observations which have been made have been concerned with the trustworthiness of this method of diagnosis after the act of abortion, and the results indicate that at least for some weeks after the act the method is very reliable. Should this estimate be borne out by further and more extended observations in the conditions of actual practice, the method will prove of great value in those cases in which, owing to the interval which has elapsed since abortion, a direct bacteriological diagnosis can no longer be made.

But, of course, when the blood serum of a cow that has aborted reacts to the test, that is not because of the act of abortion, but because of the state of infection which preceded and determined the abortion; and hence it follows that, although the majority of the observations recorded in the Appendix were made on cows which had actually aborted, the results afford evidence that this method of diagnosis may prove trustworthy for the detection of the disease in apparently healthy pregnant cows in an infected herd.

NATURAL AND ACQUIRED IMMUNITY.

No evidence has been obtained during the investigation to show that natural immunity to the abortion bacillus is possessed by any individuals of the bovine species. It is true that in a number of cases attempts to infect by way of the vagina or mouth or by subcutaneous inoculation failed, but we think the failures can be better explained by attributing them to the methods of introducing the virus rather than to natural immunity, and it is to be noted that not a single negative result had to be recorded when material of established virulence was introduced by way of the blood stream. There would appear, however, to be some grounds for believing that the power of acquiring immunity varies in individuals.

In experiments 54, 55, and 56 (Heifer 5, Heifer 49, and Cow 10, all of which had aborted, Appendix I, G), it was found impossible to re-infect the animals at their next pregnancy. Heifer 5, which had aborted 99 days after infection (see Experiment 7, C), became pregnant 216 days after aborting. She received, 286 days after abortion, an enormous dose of fresh exudate by the mouth, but did not become infected. Heifer 49 had aborted 33 days after the infection (see Experiment 25, Appendix I, C), and became pregnant 326 days after aborting. She received into the juglar vein 10 c.c. of a dense emulsion of uterine exudate 357 days after aborting, and did not become infected. In the case of Cow 10 (see Experiment I, C), the date of infection was not known, but she became pregnant two years and 128 days after aborting. She received by the mouth an enormous dose of fresh uterine exudate, and did not become infected. There seems little doubt, then, that these animals had acquired a lasting or active immunity from the previous attack.

From general inquiry (see also Table VIII.) we are inclined to believe that a majority at least acquire a serviceable degree of immunity as the result of an attack, but there is no doubt that in practice a considerable proportion abort twice and a small number abort even three times.

One finds it difficult to believe that the absence of subsequent immunity in certain animals which have aborted does not, to some extent, depend on the shortness of the period between infection and abortion. That it is not due entirely to this cause, however, is shown by the case of Heifer 49, as this animal was infected only 33 days before aborting, and resisted infection 357 days afterwards.

Cows which have aborted very often return to the bull two or three times, unless a long interval has elapsed since abortion took place. It is believed by many farmers that each failure to hold to the bull really means that the cow has aborted a very young fetus. This opinion, however, is based merely on surmise, and no evidence in support of it has been obtained by carefully watching the animals which aborted at the laboratory and were afterwards put to the bull. It seems to us that one might with almost as much reason say that, in every case in which an animal which has not previously aborted does not hold to a service, a very young fetus has been aborted. It may also be pointed out that the prevalent belief from observation is that, when a cow does become infected a second time, the calf is carried for a longer period than in the first instance. The most likely explanation of the failures to pregnant seems to be that the uterine mucous membrane has not completely regenerated itself after the attack.

IMMUNIZATION.

From the first it appeared that the disease was not one against which a protective serum could be successfully used. The protection derivable even from a potent serum cannot be depended upon to last more than two or three weeks. The period of risk extends over at least $7\frac{1}{2}$ months of pregnancy in cows, and it would neither be practicable nor economically possible to give the ordinary cow a protective dose of a rather expensive serum every fortnight throughout that period, even were a potent serum obtainable. Moreover, as curative agents in advanced stages of disease, sera, as a rule, have little or no value.

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It was found that enormous quantities of pure virus or culture could be injected into non-pregnant animals without serious consequences, and since a 'serum alone' method seemed without promise, and there was no necessity to use a serum to modify the action of the virus, the idea of hyper-immunizing animals for the production of serum was abandoned. The most hopeful line of inquiry seemed to be the production of immunity by inoculation of large doses of pure culture. One of the great objections to the protective inoculation methods in practice is the number of operations necessary to ensure protection. But, owing to the harmlessness of large quantities of pure cultures of the abortion bacillus when injected into non-pregnant animals, it seemed possible that whatever degree of immunity could be established by a practicable number of small doses might be conveyed by inoculating one large dose.

It was necessary, of course, that the immunizing dose should be inoculated some time before the animals were put to the male, in order to give their bodies time to rid themselves of the abortion bacilli before pregnancy began, as otherwise the effect would have been to infect the pregnant uterus. The period aimed at for putting the animals to the male after inoculation was from six weeks to two months, but, of course, it could not be timed exactly.

In the first instance sheep were used on account of their small cost in comparison with that of cattle.

The results of these experiments on sheep (Experiments 64 and 65, Appendix I, J) are epitomized in the following table.

Animal.	Method of immunization.	Days after immunization when pregnancy began.	Days after immunization when tested.	Days after taking Ram when tested.	Material used, and Method of Test.	Results.
Ewe 63...	100 c.c. of culture subcutaneously.	68	119	50	10 c.c. of stomach fluid of Fœtus 45 (H. 51) subcutaneously.	Gave birth to dead lamb at full time. No abortion bacilli found in membranes or fœtus.
Ewe 64...	"	75	119	43	25 c.c. of above stomach fluid by the mouth.	Began to abort a mummified fœtus 157 days after being tupped. Abortion bacilli found in discharge.
Ewe 69...	200 c.c. of above culture subcutaneously.	69	81	12	"	Gave birth to a live lamb ten days before time. No abortion bacilli found.
Ewe 70...	"	61	81	20	10 c.c. of above fluid subcutaneously.	Aborted a dead lamb ten days before time, and 114 days after infection. Abortion bacilli found.
Ewe 65...	10 c.c. of above culture subcutaneously.	68	81	13	"	Never produced anything. Believed to be barren.
Ewe 66...	"	67	81	14	25 c.c. of above fluid by the mouth.	Began to lamb seven days over full time, and 150 days after infection. The discharges contained abortion bacilli, and the lamb was dead.
Ewe 67...	"	61	81	20	"	Ten days before full time and 150 days after infection gave birth to a living lamb. No abortion bacilli found.
Ewe 68...	"	Did not take ram.	.....	.....	.....	Died of cirrhosis of the liver.
Ewe 105a Control.	.....	.....	.....	6	5 c.c. of above fluid into jugular vein.	Gave birth to a living lamb at full time, but the lamb only lived 12 hours. No abortion bacilli found.

It will be seen that of the six protected ewes which became pregnant, one aborted at 81 days and gave evidence of being infected; one aborted a dead lamb ten days

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before time and gave evidence of being infected; one gave birth to a dead lamb seven days over time and gave evidence of being infected; one gave birth to a dead lamb at full time and gave no evidence of being infected; and two gave birth to living lambs ten days before time and gave no evidence of being infected; the control (unprotected) ewe brought forth a living lamb at full time without giving evidence of being infected, but the lamb died twelve hours after birth.

It will be observed that the disappointing results recorded above cannot be correlated with either a large or a small protecting dose of culture, or with the method by which the infecting virus was administered. Moreover, if these irregular results be compared with those contained in sheep which had not been subjected to any immunizing process (see Appendix I., F) they will be found to correspond as regards irregularity.

It is possible that sheep are not in a high degree immunizable against the bacillus of cattle abortion; but, apart from this hypothesis, the very irregular results which follow infection in normal ewes, and the fact that in spite of being infected they may carry their lambs to full time, led to the opinion that no results of any great practical value would be derived from continuing these experiments on ewes.

The results with heifers were much more encouraging (see Experiment 66. Heifers 167 and 168, Appendix I., J).

Two heifers each received subcutaneously 125 c.c. of a rich liquid culture of the bacillus of cattle abortion. Heifer 167 became pregnant 148 days after immunization. Her immunity was tested by inoculating intravenously 10 c.c. of a dense emulsion of virulent uterine exudate 188 days after immunization and 40 days after becoming pregnant. She was killed and found free from infection 112 days after the test inoculation.

Heifer 163 became pregnant 106 days after immunization. Her immunity was tested by giving her enormous doses of virulent exudate both by the mouth and vagina 36 days after becoming pregnant and 142 days after immunization, and 16 days later she received 10 c.c. of a dense emulsion of virulent exudate into the jugular vein. She was killed and found free from infection 122 days after receiving the first infecting dose.

These results with heifers are all the more encouraging when one remembers that not a single negative result followed the intravenous inoculation of unprotected heifers with uterine exudate (see Table VII., Appendix I.), and it should be noted also that the tests applied were in point of severity far beyond anything likely to be met in practice.

It was quite beyond the scope of an inquiry such as this to attempt to experiment on say 100 animals at the laboratory, nor would it have been possible to simulate the less severe conditions of infection obtaining in the field without converting the experimental station into an infected farm. Seeing, however, that the immunization process is harmless to non-pregnant animals, it should not be difficult to induce plenty of owners of infected herds to try protective inoculation under the supervision of the Board, and in this way obtain an idea of its value as a practical measure in fighting epizootic abortion. The most useful way of employing preventive inoculation would be to inoculate all non-pregnant heifers and cows in an infected establishment six weeks or two months before putting them to the bull, and the method might also be used in the same way to further develop the resistance of animals which have aborted, and which are still non-pregnant. It is possible, of course, that the protection, which in the above heifers certainly lasted at least 188 days in one case and 142 days in the other, may not in practice extend over the period of risk ($7\frac{1}{2}$ months). On the other hand, we would point out that in Experiments 54, 55, and 56 (Appendix I., G) the immunity acquired by Heifer 5 lasted at least 286 days, that Heifer 49 was immune for 357 days, and that Cow 10 retained her immunity for 2 years and 151 days. It would appear, then, that immunity once acquired may be of long duration.

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Field operations are already in progress on the treatment of infected herds. There are decided indications that there will be no lack of volunteers anxious to put their infected herds at the disposal of the committee, and a large amount of material is being prepared for observations in the field. These field observations, however, cannot be expected to mature for a year or more, when, it is possible, they may provide material for a special report.

CURATIVE MEASURES.

On account of a somewhat prevalent idea that carbolic acid given internally will cure animals affected with abortion, or prevent the infection of healthy pregnant animals, it was considered advisable to put this alleged remedy to an experimental test. Heifer 188 (see Experiment 67, Appendix I., K) was infected with virulent material 43 days after becoming pregnant, and 30 days after infection she received every other day two drachms of carbolic acid in a mash by the mouth, alternated every fortnight by subcutaneous injections of one drachm in glycerine and water given every other day. This treatment was continued for 10 weeks. She aborted 102 days after infection and in the tenth week of treatment; abortion bacilli were found in the discharges.

From the first it seemed most unlikely that carbolic acid or any other disinfectant administered even in a poisonous dose would be absorbed and reach the uterus in a sufficiently concentrated form to have any action on its bacterial contents. There are many farmers who have had no success whatever in the field with the carbolic acid treatment for abortion, and the evidence on which the alleged successes are based will hardly stand analysis. In the first place, the animals put under the treatment in practice are not known to be infected, and yet every one which does not abort is regarded as cured by the advocates of the method. In the second place, the treatment is usually adopted towards the end of an outbreak, that is to say, at a time when abortion is practically confined to a proportion of the animals recently brought into the herd; and the reduction in the number of cases is attributed to the alleged remedy, whereas it is more open to a totally different explanation, viz., that after the third year the disease practically confines itself to some of the new animals brought in, with the result that since these form only a small proportion of the whole the opportunities for infection are greatly diminished.

The usual history of an outbreak of abortion is that for the first two or even three years it claims many victims in the original herd, and after this one gets only a few odd cases a year, unless many new animals have been introduced.

Heifer 188 may be said to have been vigorously treated with carbolic acid, but the treatment completely failed, and on account of the slender foundation upon which the carbolic treatment rests we did not feel justified in pursuing this experiment further.

Experiments were also undertaken to see whether actually infected animals could be successfully treated by subcutaneous injections of bacilli killed at 55° C. (see Appendix I., K, Experiments 68, 69, 70, and 71, Heifers 173, 189, 187, and 190). With the exception of Heifer 190, they were all infected by intravenous inoculation, exudate being used.

Heifer 173 was treated every week for ten weeks, starting a fortnight after infection. Treatment was begun with doses of 30 c.c. of dead liquid culture.* The doses were fairly rapidly increased to 200 c.c. as soon as it was found that the dead bacilli injected subcutaneously produced no alarming effect. In all she received 1,350 c.c., but she nevertheless aborted about the average time after infection (123 days).

Heifer 189 did not abort, but her case cannot be fairly considered, as she was only 17 days infected and had been only once treated when she calved.

* This dose represents the amount of original liquid, but in reality the animals received cultures evaporated to a small bulk.

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Heifer 187 was put under treatment 28 days after infection and received fortnightly doses, starting with 100 c.c. and going immediately to 200 c.c. She received in all 700 c.c. She was killed 112 days after infection, and found healthy.

Heifer 190 was infected by the mouth, and treatment was commenced 51 days after infection. She received monthly doses of 400 c.c. for three months, amounting in all to 1,200 c.c., but it is probable that the last dose given eight days before slaughter was unnecessary. She was killed 113 days after infection, and although pregnant was found to be absolutely healthy.

It would appear that treatment with dead bacilli failed in one case (Heifer 173), but succeeded in two other cases (Heifer 187 and Heifer 190). The treatment of Heifer 173 was begun under more favourable conditions, since the animal was only fourteen days infected at the start. The initial doses, however, were, comparatively speaking, small, although the total amount of material was enormous. The treatment in the cases of Heifers 187 and 190 was begun much later—at the 28th and 51st day, respectively, after infection, but the initial doses administered were much larger. One cannot hope to settle the value of this treatment in the laboratory, but, since it is harmless, there should be no difficulty in getting owners of infected herds to try it. Infected herds have already been put at our disposal, and the suspected animals will be treated with large doses of dead bacilli. It is hoped the results along with those of immunization will provide enough material for a future report.

The plan of the field observations on treatment is to try to pick out the infected animals by one of the methods mentioned under 'Diagnosis,' isolate them, and treat them with large doses of dead cultures.

PREVENTION AND ERADICATION.

The methods which have been relied upon in the past for the prevention of abortion and its eradication from a herd are:—

- (1) Periodical spraying of the external genital organs and hind quarters with disinfectant solutions.
- (2) Isolation of animals as soon as they show the premonitory signs of abortion.
- (3) Internal administration of carbolic acid to animals supposed to be infected or exposed to infection.
- (4) Irrigation of the genital passages of animals which have aborted with antiseptic solutions.
- (5) Removal and disposal of animals which have aborted.
- (6) The keeping of a special bull for serving animals which have aborted, or, what is based on the same idea, the disinfection of the external genital organs of the bull with antiseptic solutions after he has served such a cow.
- (7) Destruction of the abortion membranes, and disinfection of the parts of the buildings, litter, &c. with which the infective material has come in contact.
- (8) The keeping of a goat, especially a male goat, in a byre with the cows.

It cannot be said of the above measures that either singly or collectively they have brought about any material improvement in the general condition of our herds in relation to abortion. According to reports, decided improvements have been effected in individual herds by the adoption of isolation and disinfection, while in others very little has been accomplished. Some of the above methods are founded on nothing more than ignorant empiricism, while others are based on pathological and physiological considerations which are only partially correct in their applications. Since most of them have obtained a certain amount of hold, at least on the minds of stockowners, it may be useful to discuss each measure separately in the light of our recent investigations.

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Spraying of the External Genital Organs.—This is done on the assumption that virulent material may at intervals come in contact with the external genital organs, and that if the latter be sprayed with disinfectants the virus will be destroyed. In the section dealing with methods of infection we have pointed out that it is highly improbable that infection can take place through the agency of virulent material which has been merely deposited on or about the external genital organs. Apart from this, however, to be effectual, any bactericidal agent would require to be applied to the material almost at the moment when it comes in contact with the genital organs—an impossible thing to accomplish by periodical spraying, or by any other method which is practicable. We think, therefore, that this method is useless so long as the animals remain in an infected byre, and that it may be discarded. Immediately before removing an animal from infected to clean premises, however, we think it would be advisable to thoroughly wash the posterior portions of its body with a disinfectant solution, such as corrosive sublimate, 1 in 2,000, or carbolic acid, 3 per cent.

Isolation of Animals as soon as they show Signs of Abortion.—The necessity for this measure is obvious, and its importance cannot be too much insisted on. In the section on 'the virulent materials' it was explained that an infected animal only becomes infective to others immediately before the act of abortion, and may remain so for some weeks afterwards. Under the heading of 'Symptoms,' however, it was stated that only a proportion of the affected animals showed premonitory symptoms, and that quite a number may abort amongst their companions without warning. Under such conditions, then, measures of immediate isolation lose much of their undoubted theoretical value, owing to the difficulty in the way of carrying them out in practice. There is not likely to be any serious difficulty in diagnosing the bacterial disease after the act of abortion, even in an isolated case, if the membranes are available in a reasonably fresh state. Should the 'fixation of the complement' and 'abortion' tests (see section on Diagnosis), justify in actual practice the hopes raised by their application in the laboratory, they will not only constitute additional means of establishing the diagnosis after the act, but will furnish a method of diagnosing the disease a considerable time before the uterus has ejected its virulent contents, and so give to measures of isolation their full and undoubted value in practice.

Isolation of the affected animals, however, must be complete before and after the act to be of any real value. Having regard to what appears to be the most common form of infection, viz., by ingestion, we do not think that anything material is to be gained by merely putting all the cows about to abort and those which have aborted at the lower end of a byre, so that the infective discharges may not come in contact with the external genital organs of their fellows, unless we assume that infection frequently takes place by an animal licking virulent material from a part of its body where it has been deposited by flicks of the tail which has been contaminated by lying in the gutter behind the stalls.

Internal Administration of Carbolic Acid.—The uselessness of carbolic acid and other antiseptics as curative agents has already been referred to. As a preventive agent by internal administration we believe carbolic acid to be equally useless. Even if it were possible to administer very large doses of this poisonous substance, one could not expect to be able to give enough to destroy the bacilli which have been swallowed and mixed with the contents of the enormous stomachs and intestines, and it would be equally hopeless to expect to destroy in this way the bacilli which have already reached the womb. This alleged measure of prevention must be regarded as an absurdity which has gained a certain amount of support owing to observations carelessly collated and carelessly interpreted.

Irrigation of the Genital Passages after Abortion.—With the act of abortion the greater part of the uterine exudate is immediately ejected. That some of it remains

behind for a short period is certain, since we were able to demonstrate abortion bacilli in material obtained from the vagina of a heifer three days after she had aborted (see Appendix I, C, Experiment 18, Heifer 41). On the other hand, no abortion bacilli could be found in the uterus of Heifer 173 (Experiment 63) a month after she had aborted. It seems probable that, as a rule, the genital organs cleanse themselves by natural means a comparatively short time after abortion has taken place (see also 'Methods of Infection'). Almost immediately after abortion and expulsion of the membranes the uterus contracts, and its internal surfaces come into apposition. Its condition is such that it would not be possible to force fluid into it with a pump from the vagina. Apart then, from the probability that disinfection of the uterus by antiseptics is not necessary to rid the organ of abortion bacilli, we are of opinion that it is futile to attempt it by irrigation methods. So long as a discharge continues to come from the genital passages, we think that for hygienic and therapeutic reasons they ought to be cleansed once or twice daily by the intra-vaginal injection of tepid antiseptic solutions, such as a 2 per cent solution of carbolic acid or a 1 in 3,000 the uterus. We are of opinion that it will seldom be necessary to continue the injections for more than a month, and that after three months there should be small risk in putting the cow to the bull, provided she is afterwards protected against fresh infection. In this connection we would again draw attention to the experiments in Appendix I, E and G, in which cows which had previously aborted did not become infected at their next pregnancy whether their genital passages were irrigated after abortion or not.

Removal and disposal of Animals which have aborted.—It is quite a prevalent custom to feed for the butcher cows which have aborted. It is also customary to sell such cows alive in the open market. The second custom we consider likely to introduce disease to other establishments, unless the animals have ceased to discharge; they should, we think, be kept for at least three months after abortion before being sent for sale.

The first custom is less objectionable than the second, but we think that a breeder will be more likely to get rid of abortion from his herds by keeping such animals than by disposing of them and bringing in new ones before his entire herd is free from the disease. There can be no doubt that in most cases an attack of the disease greatly increases an animal's resistance to future attacks, and that in a large proportion of the affected, probably in the majority, this resistance is sufficient to fortify them against infection during their next pregnancy. It is beyond doubt that a considerable proportion may abort twice in succession, but it is not improbable that inoculation methods may now be successfully employed to exalt their resistance. In the midst of infection there is no better guarantee against the disease than the possession of an immune stock, and for this reason we consider that on infected premises the animals which have already aborted are to be looked upon as valuable assets for purposes of eradication, much more valuable than the new and susceptible animals brought in. We find, however, that a small proportion of cows will not hold to the bull for an indefinite period after abortion, and it may be found better to fatten off such animals, unless they are of high value.

The keeping of a Special Bull for Cows which have aborted.—We have already stated that we do not consider the bull a factor of the first importance in the dissemination of abortion, but that infection by means of a contaminated bull must be looked upon as a distinct possibility. We think, therefore, that there is something to be said in favour of keeping a bull for the service of cows which have aborted, and, when that is not possible, of disinfecting the external genital organs of the bull after he has served such cows. Of course, if the cows can be immunized the same bull might be used for all. We do not think that cows from a clean establishment should be sent even to a clean bull on infected premises, and it is also inadvisable that cows from infected premises should be sent to a bull on a clean establishment.

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Destruction of Virulent Material and disinfection of everything contaminated by it.—The immediate disinfection of the virulent materials and contaminated objects is of great importance, more especially as it appears that the natural virus may remain active for a long time outside the body. The soiled litter, dung, exudate, membranes, and fœtus should all be removed at once, preferably after they have been treated with caustic lime. After removal they should be soaked in paraffin and burned, or buried in a deep pit, preferably the former. On no account should the fœtus and membranes be fed to pigs or dogs. When a fœtus is aborted alive, as sometimes happens, it seldom survives long, and it is advisable to kill and destroy it, since it may excrete abundance of virulent material from its intestines if allowed to live. If, however, it be decided not to kill it, it should immediately be isolated. The walls of the stall and the floor should be washed or strewn thickly with caustic lime, or drenched freely with boiling water. The temperature necessary to kill the bacillus is not great, and this simple method of disinfection should prove efficacious. Lastly, the boots, clothing, and hands of attendants should be disinfected by making use of any reliable disinfectant, such as a 3 or 4 per cent solution of carbolic acid.

The keeping of a Goat amongst the Cows.—This, we believe, can only have its origin in ignorant superstition, but we feel bound to mention it, as the question of its efficacy has quite frequently been seriously put to us. We would point out that goats themselves can be infected with cattle abortion, and that both male and female goats were on our premises during the greater part of the time occupied with the cattle experiments, and their presence did not prevent animals from aborting.

Preventive Inoculation.—At this stage of the inquiry we think we are justified in provisionally adding preventive inoculation to the prophylactic measures previously discussed.

In the section of this Report dealing with immunization (*see also* Appendix I, J) we cited experimental evidence to show that the bovine female can be rendered highly resistant to infection with virulent material by the subcutaneous injection of a comparatively large quantity of active liquid culture of the abortion bacillus, and it was also explained that the inoculation must be performed about two months before the commencement of pregnancy. A considerable number of observations on the value of this method of preventive inoculation are now being conducted on infected herds in different parts of the country, but, as will be well understood the value of the method cannot be estimated until a relatively large number of the inoculated animals exposed to natural infection either abort or give birth to calves at full term. Should the results under the conditions of actual practice bear out those already obtained in the laboratory, stockowners will be in possession of a preventive method which is perhaps the most valuable of all methods for dealing with a disease of the nature of epizootic abortion. Of course, one would only employ such a method in herds in which infection already exists, and the best way to make use of it will be, assuming that the results in practice bear out those obtained at the laboratory, to inoculate all new animals coming in, and those already in the herd which have calved normally, about two months before they are put to the bull. Since one cannot be certain that every animal which has aborted will have acquired immunity, it will be advisable also to inoculate the latter to exalt whatever degree of resistance they have acquired from the natural attack, but, as already mentioned, the animals which have aborted should not be put to the bull for a period of three months.

For reasons already explained it is not possible to immunize pregnant animals with living cultures. It is possible, however, that a not inconsiderable degree of immunity of shorter duration may with safety be bestowed on pregnant animals by inoculating them with a large dose of bacilli which have been killed at a low temperature. This, however, will be dealt with in a later Report.

LEGISLATIVE MEASURES OF PREVENTION.

We refrain at this stage from making any recommendations regarding measures which might usefully be taken by the Board for the prevention of epizootic abortion, as these will be dealt with in a special Report after representative agricultural witnesses have been examined.

EDWARD STRACHEY.

JOHN GILLESPIE.

J. McFADYEAN.

WILLIAM HUNTING.

GEO. H. F. NUTTALL.

STEWART STOCKMAN.

APPENDIX No. 15.

THE ANIMAL CONTAGIOUS DISEASES ACT AND THE REGULATIONS
MADE THEREUNDER RELATING TO QUARANTINE AND THE CON-
TROL OF DISEASE.CHAPTER 75.—AN ACT RESPECTING INFECTIOUS OR CONTAGIOUS DISEASES AFFECTING
ANIMALS.

(As Amended.)

SHORT TITLE.

1. This Act may be cited as the Animal Contagious Diseases Short title Act. 3 E. VII., c. 11, s. 1.

INTERPRETATION.

2. In this Act, unless the context otherwise requires,—
- | | |
|---|--------------|
| (a) 'the Minister' means the Minister of Agriculture; | Definitions. |
| (b) 'foreign animals' means animals not already introduced into Canadian territory, outside of quarantine stations; | |
| (c) 'contagious' means communicable by close contact or inoculation; | |
| (d) 'infectious' means communicable in any manner; | |
| (e) 'infectious or contagious disease' includes, in addition to other diseases generally so designated, glanders, farcy, <i>maladie du coït</i> , pleuro-pneumonia contagiosa, foot and mouth disease, rinderpest, anthrax, Texas fever, hog cholera, swine plague, mange, scab, rabies, tuberculosis, actinomycosis, and variola ovina. 3 E. VII., c. 11, s. 2; 4 E. VII., c. 6, s. 1. | |

DUTIES OF OWNERS OF ANIMALS.

3. Every owner of animals and every breeder of or dealer in animals, and every one bringing animals into Canada, shall, on perceiving the appearance of infectious or contagious disease among the animals owned by him or under his special care, give immediate notice to the Minister and to the nearest veterinary inspector of the Department of Agriculture of the facts discovered by him as aforesaid.

2. Any veterinary surgeon practising in Canada shall, immediately on ascertaining that an animal is labouring under an infectious or contagious disease, give similar notice to the Minister and to the nearest veterinary inspector. 3 E. VII., c. 11, s. 3.

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Penalty for neglect.

4. Every owner of such diseased animals who neglects to comply with the provisions of the last preceding section shall forfeit his claim to compensation for any animals slaughtered in accordance with the provisions of this Act; and no such compensation shall be granted to him. 3 E. VII., c. 11, s. 4.

SLAUGHTERING DISEASED CATTLE.

Slaughtering diseased animals.

5. The Minister may, from time to time, cause to be slaughtered animals suffering from infectious or contagious disease or suspected of being so affected, and animals which are or have been in contact with or close proximity to a diseased animal, or an animal suspected of being affected by infectious or contagious disease. 3 E. VII., c. 11, s. 11.

Compensation to owners.

6. The Governor in Council may order a compensation to be paid to the owners of animals slaughtered under the provisions of this Act; and in all cases the value of the animal for which compensation is ordered, shall be determined by the Minister or by some person appointed by him, but, except as hereinafter provided, such value shall not exceed, in the case of grade animals, one hundred and fifty dollars for each horse, sixty dollars for each head of cattle, and fifteen dollars for each pig or sheep, and, in the case of pure bred animals, three hundred dollars for each horse, one hundred and fifty dollars for each head of cattle, and fifty dollars for each pig or sheep.

May be withheld

2. Such compensation may be withheld in whole or in part whenever the owner or the person having charge of the animal has, in the opinion of the Minister, been guilty in relation to the animal of an offence against this Act, or whenever the animal being a foreign one was in his judgment diseased at the time of entering Canada. 3 E. VII., c. 11, s. 12.

Basis of compensation.

7. The compensation, if any, shall be two-thirds of the value of the slaughtered animal, determined as aforesaid, before it became affected with infectious or contagious disease, or came in contact with or in dangerous proximity to animals so affected. Provided that,—

(a) when it is clearly shown that an animal has been slaughtered on insufficient grounds and that the slaughter was not in accordance with or justifiable under this Act, the owner shall be entitled to compensation at the full value of the animal so slaughtered; and,

(b) if in any case, the sum received by the Government on the sale of a carcass of an animal slaughtered exceeds the amount paid for compensation to the owner of the animal, the excess after deduction of reasonable expenses shall be paid to the owner. 3 E. VII., c. 11, s. 12; 4 E. VII., c. 6, ss. 2 and 3.

Experimental treatment and *post mortem* examination.

8. The Minister may, notwithstanding anything in this Act, reserve for experimental treatment any animal ordered to be slaughtered under this Act, and may authorize any of his officers or persons employed by him to make *post mortem* examinations of animals which have died, or are supposed to have died, from infec-

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tious or contagious disease, and to dig up carcasses of such animals for the purpose of investigation. 3 E. VII., c. 11, s. 13.

PROHIBITION OF IMPORTATION.

9. The Minister may, from time to time, prohibit the importation ^{Governor in Council may} or the introduction into Canada, or any part thereof, or into any particular ports thereof, of animals, or of flesh, hides, hoofs, horns ^{prohibit im-} or other parts of animals, or of hay, straw, fodder or other articles, either generally or from any places named in the order, for such period as he deems to be necessary for the purpose of preventing the introduction of any contagious or infectious disease among animals into Canada. 3 E. VII., c. 11, s. 14.

OFFICERS AND THEIR DUTIES.

10. The Minister may appoint inspectors and other officers when ^{Appointment} he deems it necessary, but such appointments shall be confirmed by ^{of officers.} the Governor in Council within thirty days of the date thereof. 3 E. VII., c. 11, s. 16.

11. Inspectors or other officers appointed as aforesaid, on receiving ^{Duties of} information of the supposed existence of any infectious or contagious disease among animals, shall proceed to the place mentioned with all practicable speed, and execute and discharge their duties pursuant to the regulations made under the authority of this Act and the instructions received by them. 3 E. VII., c. 11, s. 17.

12. Any inspector or other officer appointed as aforesaid may, at ^{Inspector's} any time, for the purpose of carrying into effect any of the provisions of this Act, enter any place or premises, or any steamship, vessel or boat, or any carriage, car, truck, horse-box or other vehicle used for the carriage of animals, but shall, if required, state in writing the grounds on which he has so entered. 3 E. VII., c. 11, s. 36.

13. If any animal infected with or labouring under any infectious ^{Seizure of} or contagious disease, or suspected of being so affected is sold, disposed of, or put off, or is exposed or offered for sale in any place, or is brought or attempted to be brought for the purpose of being exposed or offered for sale in any market, fair or other open or public place where other animals are commonly exposed for sale, any clerk or inspector, or other officer of the fair or market, or any constable or policeman, or any other person authorized by the mayor or reeve, or by any justice of the peace having jurisdiction in the place, or any person authorized or appointed by the Minister, may seize the animal and report the seizure to the mayor or reeve, or to any justice of the peace having jurisdiction in the place; and such mayor, reeve or justice, or person authorized or appointed by the Minister, may, after veterinary examination and verification, cause the animal, together with any pens, hurdles, troughs, litter, hay, straw, or other articles which he judges likely to have been

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infected thereby, to be forthwith destroyed, or otherwise disposed of, in such manner as he deems proper, or as is directed, as provided by this Act. 3 E. VII., c. 11, s. 10.

**Apprehension
of persons.**

14. Any inspector or constable may, without warrant, apprehend any person found committing an offence against the provisions of this Act with respect to infected places, and shall take any person so apprehended forthwith before a justice of the peace to be examined and dealt with according to law; and a person so apprehended shall not be detained in custody without the order of a justice longer than twenty-four hours; and any inspector or constable may require that any animal or thing moved out of an infected place in violation of the provisions of this Act be forthwith taken back within the limits of that place, and may enforce and execute such requisition at the expense of the owner of such animal or thing. 3 E. VII., c. 11, s. 43.

INFECTED PLACES.

**Notice to
owners.**

15. Whenever an inspector finds or suspects infectious or contagious disease of animals to exist, he shall forthwith make a declaration thereof under his hand and shall deliver a copy of such declaration to the occupier of the common, field, stable, cowshed or other premises where the disease is found; and thereupon the same, with all lands and buildings contiguous thereto in the same occupation, shall be deemed to be an infected place; and the same shall be held to be an infected place until the determination and declaration of the Minister relative thereto in this Act provided for. 3 E. VII., c. 11, s. 18.

**Report to
Minister.**

16. Whenever an inspector makes such a declaration of the existence or suspected existence of infectious or contagious disease of animals, he shall, with all practicable speed, send a copy thereof to the Minister; and if it appears that infectious or contagious disease exists, the Minister may so determine and declare, and may prescribe the limits of the infected place; but if it appears that it did not exist, the Minister may so determine and declare, and thereupon the place comprised in the inspector's declaration, or affected thereby, shall cease to be deemed an infected place. 3 E. VII., c. 11, s. 19.

**Notice to
occupant.**

17. Whenever, under this Act, an inspector makes a declaration which constitutes a place an infected place, he may also, if the circumstances of the case appear to him so to acquire, deliver a notice under his hand of such declaration to the occupiers of all lands and buildings adjoining thereto, any part whereof respectively lies within one mile of the boundaries of the infected place in any direction, and thereupon the provisions of this Act with respect to infected places shall apply to and have effect in respect of such lands and buildings as if the same were actually within the limits of the infected place. 3 E. VII., c. 11, s. 20.

**Area of infected
locality.**

18. The area of an infected place may, in all cases of a declaration by the Minister, include any common, field, stable, cowshed or other premises in which infectious or contagious disease has been

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found to exist, and such an area as to the Minister seems requisite; and the Minister may, from time to time, by order, extend or curtail the limits of an infected place beyond the boundaries of the common, field, stable, cowshed, farm or premises where infectious or contagious disease is declared or found to exist. 3 E. VII., c. 11, s. 21.

19. The area of an infected place may, in any case, be described by reference to a map or plan deposited at some specified place, or by reference to townships, parishes, farms or otherwise. 3 E. VII., c. 11, s. 22.

20. The Minister may, at any time, upon the report of an inspector, by order, declare any place to be free from infectious or contagious disease; and thereupon, and from the time specified in that behalf in the order, the place shall cease to be deemed an infected place. 3 E. VII., c. 11, s. 23.

21. An order of the Minister relative to an infected place shall supersede any order of a local authority inconsistent with it. 3 E. VII., c. 11, s. 24.

22. The provisions of this Act with respect to infected places, shall not restrict the moving of any person, animal or thing by railway or other mode of transport on highways through an infected place, if such person, animal or thing is not detained within the infected place, unless such transport is prohibited. 3 E. VII., c. 11, s. 25.

23. Whenever under this Act a place has been constituted an infected place, no live animal, nor the flesh, head, hide, skin, hair, wool or offal of any animal or any part thereof, nor the carcass nor any remains of any animal, nor any dung of animals, nor any hay, straw, litter or other thing commonly used for and about animals, shall be removed out of the infected place, without a license signed by an inspector appointed as aforesaid, until said place has been released by order of the Minister. 3 E. VII., c. 11, s. 26.

CLEANSING OF VESSELS, VEHICLES AND PREMISES.

24. Every company and every person carrying for hire animals to or in Canada, shall thoroughly cleanse and disinfect, in such manner as the Governor in Council, from time to time, directs, all steamships, steamers, vessels, boats, pens, carriages, trucks, horse-boxes and vehicles used by such company or person for the carrying of animals; and the Governor in Council may cause any such steamship, steamer, vessel, boat, carriage, truck, horse-box or vehicle, to be detained at such place as to him seems meet, until it is so cleansed and disinfected. 3 E. VII., c. 11, s. 27.

25. If the company or person using such steamship, steamer, vessel, boat, carriage, truck, horse-box or vehicle for the carrying of animals, fails to cause the same to be so cleansed and disinfected within such time after being notified so to do as the Minister directs,

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the Minister may cause the same to be cleansed and disinfected at the expense of such company or person. 3 E. VII., c. 11, s. 27.

Premises to be
in sanitary
condition.

26. All yards, stables, sheds or other premises used by railway or steamship companies or other persons for the accommodation of animals shall be maintained in a clean, comfortable and sanitary condition, and shall be subject at all times to inspection by inspectors acting under the authority of the Minister, who, when they deem such action necessary, may order the cleansing and disinfection in a satisfactory manner of the said yards, stables, sheds or other premises. 3 E. VII., c. 11, s. 28.

Refusal to
comply with
orders of
inspector.

27. In the event of any railway or steamship company or other person refusing or neglecting to carry out the orders of the inspector in regard to such cleansing or disinfection, or in the event of such company or person neglecting to maintain its yards, stables, sheds or other premises for the use of animals, in a clean, comfortable and sanitary condition, the inspector may condemn the said premises as unfit for use; whereupon the said premises shall not be used for the accommodation of animals until such time as the orders of the inspector in regard thereto have been satisfactorily carried out. 3 E. VII., c. 11, s. 28.

REGULATIONS.

Governor in
Council may
make regu-
lations.

28. The Governor in Council may from time to time, make such regulations and orders as to him seem necessary for any of the following purposes, that is to say:—

Quarantine.

(a) For subjecting animals to quarantine, or for causing the same to be destroyed upon their arrival in Canada, or for destroying any hay, straw, fodder or other article whereby it appears to him that infection or contagion may be conveyed, and generally for regulating the importation or introduction into Canada of animals in such manner as to prevent the introduction of any infectious or contagious disease in Canada;

Separation.

(b) For the keeping separate, treatment and disposal of, and dealing generally with animals affected with infectious or contagious diseases, or suspected of being so affected, or which have been in contact with animals so affected or suspected of being so affected, and for the prevention of the spread of infectious or contagious diseases;

Districts of
quarantine.

(c) For segregating and confining animals within certain limits, for establishing districts of inspection or of quarantine, and for prohibiting or regulating the removal to or from such parts of or places in Canada, as he designates in such regulations, of animals, or of meats, skins, hides, horns, hoofs or other parts of any animals, or of hay, straw, fodder or other articles likely to propagate infection;

Purification.

(d) For purifying any yard, stable, outhouse or other place, or any wagons, carts, carriages, cars or other vehicles, or any vessels, and for directing how any animals dying in a diseased state, or any animals, parts of animals, or other things seized under the provisions of this Act, are to be destroyed or otherwise disposed of;

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- (e) For causing notices to be given of the appearance of any disease among animals; Notice of disease.
- (f) For requiring notice of the appearance of any such disease among animals;
Requiring notice.
- (g) For prohibiting or regulating the holding of markets, fairs, exhibitions or sales of animals; Prohibiting markets.
- (h) For declaring any market, railway yard, stock yard, pen, wharf, steamship, steam or other vessel, railway car or other vehicle, on or in which animals are exposed for sale, or are placed for the purpose of transit, to be infected, and for declaring the same to be no longer infected; Declaring market, etc., infected.
- (i) For the slaughtering of animals as provided for by this Act; Slaughtering animals.
- (j) For requiring proof of the fact that animals imported into or passing through Canada have not, at the time of their embarkation, been brought from any place or locality where any contagious or infectious disease is, at the said time, in existence; Proof as to animals imported.
- (k) For exempting certain contagious and infectious diseases from the operation of certain specified clauses of this Act, and for dealing with the said diseases as may to him seem necessary and advisable; Certain exceptions.
- (l) Generally, any orders which he thinks it expedient to make for the better execution of this Act, or for the purpose of, in any manner, preventing the spreading of and for the extirpation of contagious or infectious disease among animals, whether any such orders are of the same kind as the kinds enumerated in this section or not. Generally.

2. The Governor in Council may from time to time, define the limits of ports and of other circumscriptions for the purposes of this Act. 3 E. VII., c. 11, ss. 15, 29 and 30.

29. The Minister may, from time to time, make such regulations as to him seem necessary for preventing the removal, without a license signed by an inspector or other officer appointed as aforesaid, of live animals, or the hide, skin, hair, offal of any animals or any part thereof, the carcass or any remains of any animal, any dung of animals, and any hay, straw, litter or other thing commonly used for or about animals, out of an infected place. 3 E. VII., c. 11, s. 30. Preventing removal of animals.

30. Every regulation made under the provisions of this Act shall have the like force and effect as if it had been embodied in this Act. 3 E. VII., c. 11, s. 31. Effect of such orders.

PUBLICATION AND EVIDENCE.

31. Every order in council prohibiting the importation or the introduction of animals into Canada, or establishing quarantines for animals, ordering the slaughtering of animals or declaring any market, railway yard, stock yard, pen, wharf, steamship, steam or other vessel, railway car or other vehicle to be infected, and every order of the Minister declaring any place infected shall be published twice in the *Canada Gazette*. 3 E. VII., c. 11, s. 32. Publication of orders in council.

Orders in Council to be evidence.

32. An Order of the Governor in Council declaring any market, railway yard, stock yard, pen, wharf, steamship, steam or other vessel, railway car or other vehicle to be infected, or of the Minister, declaring a place to be an infected place, or a copy of the declaration of the Inspector certified by him, a notice of which has been delivered as required by this Act, shall be *prima facie* evidence of the existence of disease, or of the suspicion of such disease and other matters to which the order or declaration relates. 3 E. VII., c. 11, s. 33.

Proof of orders or regulations.

33. Any order or regulation made or issued under this Act, or under any order of the Governor in Council, or of the Minister, may be proved by the production of a printed or other copy of such order or regulation, certified by the Minister; and any such order or regulation shall, until the contrary is proved, be deemed to have been duly made and issued at the time at which it bears date. 3 E. VII., c. 11, s. 34.

Inspector's certificate.

34. The certificate of an inspector or an officer, as aforesaid, to the effect that an animal is affected with an infectious or contagious disease shall, for the purposes of this Act, be *prima facie* evidence of the matter certified. 3 E. VII., c. 11, s. 35.

OFFENCES AND PENALTIES.

Neglect to give notice.

35. Every person who neglects to give notice, as required by this Act, of any facts discovered or perceived by him indicating the appearance or the existence of infectious or contagious disease among animals owned by him or under his special care, or who conceals the existence of infectious or contagious disease among animals, shall incur a penalty not exceeding two hundred dollars. 3 E. VII., c. 11, ss. 3 and 4.

Keeping diseased animal.

36. Every person who turns out, keeps or grazes in or upon any forest, wood, moor, beach, marsh, common, waste-land, open field, road-side, or other undivided or uninclosed land, any animal, knowing it to be infected with or labouring under any infectious or contagious disease, or to have been exposed to infection or contagion, shall, for every such offence, incur a penalty not exceeding two hundred dollars. 3 E. VII., c. 11, s. 5.

Bringing such animals to market.

37. Every person who brings or attempts to bring into any market, fair or other place, any animal known by him to be infected with or labouring under any infectious or contagious disease, shall, for every such offence, incur a penalty not exceeding two hundred dollars. 3 E. VII., c. 11, s. 6.

Selling or putting off such animals.

38. Every person who sells or disposes of, or puts off, or offers or exposes for sale, or attempts to dispose of or put off any animal infected with or labouring under any infectious or contagious disease or the meat, skin, hide, horns, hoofs or other parts of an animal infected with or labouring under any infectious or contagious disease at the time of its death, whether such person is the owner of the animal, or of such meat, skin, hide, horns, hoofs or other parts of such an animal or not, shall, for every such offence, incur a penalty not exceeding two hundred dollars. 3 E. VII., c. 11, s. 7.

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39. Every person who throws or places, or causes or suffers to be thrown or placed, in any river, stream, canal, navigable or other water, or in the sea, within ten miles of the shore, the carcass of an animal which has died of disease, or which has been slaughtered as diseased or as suspected of disease, shall for every such offence, incur a penalty not exceeding two hundred dollars. 3 E. VII., c. 11, s. 8. ^{Throwing carcasses into rivers, etc.}

40. Every person who, without lawful authority or excuse, digs up or causes or allows to be dug up the buried carcass of an animal which has died or is suspected of having died from infectious or contagious disease, or which has been slaughtered as diseased or as suspected of disease, shall, for every such offence, incur a penalty not exceeding two hundred dollars. 3 E. VII. c. 11 s. 9. ^{Digging up any such carcasses, or when buried.}

41. Every person who refuses to admit any inspector or other officer into any place or premises or any steamship, vessel or boat, or any carriage, car, truck, horse-box, or other vehicle used for the carriage of animals, or who obstructs or impedes the execution of any order or regulation made by the Governor in Council or the Minister under this Act, shall, for every such offence incur a penalty not exceeding one hundred dollars; and the inspector or other officer may apprehend the offender and take him forthwith before a justice of the peace to be dealt with according to law; but no person so apprehended shall be detained in custody, without the order of a justice, longer than twenty-four hours. 3 E. VII., c. 11, s. 37. ^{Impeding execution of this Act.}

42. If any animals are imported or introduced, or attempted to be imported or introduced into Canada, contrary to the provisions of any order or regulation made in pursuance of this Act, the animals shall be forfeited and may be forthwith destroyed or disposed of, as the Minister or any person employed by him in that behalf directs; and every person who imports or introduces, or attempts to import or introduce, any animal into Canada, contrary to the provisions of any such order or regulation, shall incur a penalty not exceeding two hundred dollars, for every animal so imported or introduced, or attempted to be imported or introduced by him. 3 E. VII., c. 11, s. 38. ^{Forfeiture of animals imported contrary to order in council.}

43. Every person who moves, or causes or allows to be moved, any animal, hide, skin, hair, wool, horn, hoof, offal, carcass, meat, dung, hay, straw, litter or other thing in violation of the provisions of this Act with respect to infected places, shall, for every such offence, incur a penalty not exceeding two hundred dollars. 3 E. VII., c. 11, s. 39. ^{Unlawful removal of any animal.}

44. Whenever a person having animals in his possession or keeping within a district wherein infectious or contagious disease exists, affixes at the entrance to a building or inclosed place in which such animals are kept, a notice forbidding persons to enter into that building or place without his permission, any person not having a right of entry or way into that building or place who knowingly enters into the same, or any part thereof, in violation of the notice, ^{Entering when entrance is forbidden.}

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shall, for every such offence, incur a penalty not exceeding twenty dollars. 3 E. VII., c. 11, s. 40.

Neglect to
cleanse vessel.

45. Every person who fails to comply with the requirements of any order made under the authority of this Act respecting the cleansing and disinfecting of steamships, vessels, boats, pens, carriages, trucks, horse-boxes or vehicles used by such person for the carriage of animals, shall, for every such offence, incur a penalty not exceeding two hundred dollars. 3 E. VII., c. 11, s. 41.

Violation of
regulations.

46. Every person who violates any provision of this Act, or of any regulation made by the Governor in Council or by the Minister, under the authority of this Act, in respect to which no penalty is hereinbefore provided, shall, for every such offence, incur a penalty not exceeding two hundred dollars. 3 E. VII., c. 11, s. 42.

PROCEDURE.

Place of trial.

47. Every offence against this Act, or against any order or regulation of the Governor in Council, or of the Minister, and every cause of complaint under this Act, may be prosecuted and tried either in the place in which such offence or cause of complaint was committed or arose, or in any place in which the person charged or complained against happens to be. 3 E. VII., c. 11, s. 44.

Recovery of
penalties.

48. Every penalty imposed by this Act shall be recoverable, with costs, before any two justices of the peace, or any magistrate having the powers of two justices of the peace, under Part XV. of the Criminal Code. 3 E. VII., c. 11, s. 45.

HEALTH OF ANIMALS BRANCH

QUARANTINE REGULATIONS.

Authorized by Order in Council, dated 30th November, 1909.

As Amended by Order in Council of 19th August, 1911.

INTERPRETATION.

Sec. 1. In these Regulations, unless the context otherwise requires:—

- (a) The expression 'the Minister' means the Minister of Agriculture;
- (b) The expression 'inspector' means a veterinary or other inspector duly appointed under the provisions of the Animal Contagious Diseases Act;
- (c) The expression 'veterinary inspector' means a duly qualified veterinary surgeon appointed an inspector under the provisions of the Animal Contagious Diseases Act;
- (d) The expression 'inspection' means an inspection made by a duly authorized inspector;
- (e) The expression 'contagious' means communicable by close contact or inoculation;
- (f) The expression 'infectious' means communicable in any manner;
- (g) The expression 'infectious or contagious disease' includes, in addition to other diseases generally so designated, glanders, farcy, maladie du coït, contagious pleuro-pneumonia, foot and mouth disease, rinderpest, anthrax, Texas fever, hog cholera, swine plague, mange, scab, rabies, tuberculosis, actinomycosis and variola ovina.

Sec. 2. The Veterinary Director General is in charge of the Health of Animals Branch of the Department of Agriculture.

Sec. 3. The following Customs ports are hereby declared to be Animals Quarantine Stations, and all animals imported into Canada subject to quarantine must be entered through said Stations, viz.:—Halifax, Yarmouth, N.S.; St. John and McAdam Junction, N.B.; Charlottetown, P.E.I.; Sherbrooke and St. John, Que.; Bridgeburg, Windsor, Sarnia, Sault Ste. Marie and Fort Frances, Ont.; Emerson, Gretna and Bannerman, Man.; North Portal, Wood Mountain, Big Muddy and Willow Creek, Sask.; Pendant d'Oreille, Coutts and Twin Lakes, Alta.; Gateway, Kingsgate, Rossland, Nelson, Grand Forks, Midway, Mynceaster, Keremeos, Osoyoos, Huntingdon, New Westminster, White Rock, Vancouver and Victoria, B.C.; Whitehorse, Y.T. Quebec is also declared to be an Animals' Quarantine Station in so far as importations into Canada by sea are concerned.

Sec. 4. Animals subject to inspection only, but which are not subject to quarantine, may enter through the aforesaid and at the following ports:—Pictou, North Sydney, N.S.; St. Stephen's, Woodstock, Edmundston, Grand Falls, St. Leonards, Debec Junction, Florenceville and Aroostook Junction, N.B.; Comin's Mills, Lake Megantic, Beauceville, Coaticooke, Beebe Junction, Highwater, Abercorn, St. Armand, Lacolle Junction, Noyan Junction, Athelstan, Dundee and St. Agnes de Dundee, Que.; Cornwall, Prescott, Morrisburg, Brockville, Kingston, Cobourg, Toronto,

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Niagara Falls, Port Arthur, Rainy River, Ont.; Snowflake, Man.; Marienthal, Sask.; Rykerts, Bridesville, and Nanaimo, B.C.

Sec. 5. The Minister of Agriculture is hereby empowered to cancel as quarantine and inspection stations any of the places above named and to select such other sites in exchange for, or in addition to, the above as he may from time to time deem expedient.

IMPORTATIONS IN GENERAL.

Sec. 6. The Minister may prohibit or regulate the importation of animals from any country or any district where he has reason to believe that contagious disease of animals exists.

Sec. 7. (a) Persons contemplating the importation of animals from any part of the world, except the United States and Newfoundland, must first obtain from the Minister a permit therefor. Such permits shall not be available at any port other than the one mentioned therein.

(b) Applications for such permits shall be in writing, and shall state the number and kind of animals for which the permit is applied, the country of origin and probable date of shipment, the port of embarkation, the port at which the animals are to be landed and the approximate date of their arrival. The statements contained therein may be required to be verified on oath, the Minister deciding in every case whether a permit will be granted.

(c) Animals from countries other than those above mentioned arriving at any port in Canada without such permit shall not be admitted to Canada unless and until ordered by the Minister.

(d) Unless otherwise ordered by the Minister, the provisions of this section shall not apply to the importation of horses from any of the countries of Europe.

Sec. 8. The importation by sea into Canada of animals from all countries, other than the United States, Newfoundland and Mexico, is prohibited except at the ports of Victoria and Vancouver, B.C.; Quebec, Que.; St. John, N.B.; Halifax, N.S.; Charlottetown, P.E.I., and such other ports as may hereafter be indicated by the Minister.

Sec. 9. Animals imported via United States ports must be accompanied not only by the necessary health certificates from the country of origin, but also by a certificate of quarantine or inspection signed by a Veterinary Inspector of the United States Bureau of Animal Industry.

Sec. 10. Persons in charge of vessels conveying animals to Canada must immediately on arrival in port, notify the Superintendent of the Animals Quarantine Station of the arrival of such vessel and the number and kind of animals on board thereof.

Sec. 11. All importers must certify under oath, before making Customs entry, the place of origin of the animals imported by them.

Sec. 12. All animals arriving in Canada through any of the above mentioned ports on the Canadian seaboard shall be subject to inspection on arrival by inspectors who may, from time to time, be appointed for that purpose.

Sec. 13. All inspections of imported animals must be made in daylight.

Sec. 14. For the purpose of carrying out these Regulations, inspectors shall have free access to any wharf, vessel, car, or to any place where animals may be found.

Sec. 15. Inspectors shall visit the vessels or cars conveying animals into the said ports, and after inspecting such animals and finding them free from disease, shall superintend their landing or unloading, order them to be placed and disposed of according to the requirements of the case, and see that those to be quarantined are conveyed to the proper quarantine station. Inspectors shall also superintend the landing, unloading and disposal of fodder, litter, blankets, troughs and other articles which may have been used by or for the said animals.

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Sec. 16. Importers of animals will be required to certify under oath that the health certificates referred to in these Regulations apply to the said animals and to no other, and that the district named is the actual one from which these animals came.

Sec. 17. Any unauthorized interference with animals after inspection, whether by substitution or otherwise, or any evasion, or misrepresentation, will be deemed a breach of these Regulations, and in addition will render the shipment liable to seizure and detention pending the orders of the Minister as to its disposal.

Sec. 18. Inspectors may, if they deem it necessary, order the cleansing and purifying of any vessel, place, vehicle, building or article, and direct such precautionary measures to be taken as they may consider advisable pending the decision of the Minister as to the ultimate disposal of such vessel, place, vehicle, building or article.

Sec. 19. No person shall import or introduce, or attempt to import or introduce, into Canada, any animal contrary to these Regulations or which is affected with any contagious or infectious disease, and any animal which is imported or introduced, or attempted to be imported or introduced, into Canada contrary to these Regulations or which is affected with or suspected of being affected with any contagious or infectious disease, may be forthwith destroyed, refused admission to Canada, or otherwise disposed of as the Veterinary Director General may direct.

Sec. 20. The importation of head ropes which have been used for tying up cattle is prohibited, and all vessels carrying or having on board such head ropes in contravention of this Regulation shall be liable to be declared to be infected under the Animal Contagious Diseases Act.

Sec. 21. The importation of the manure of swine is prohibited.

Sec. 22. Any inspector may declare any railway car, or other land or water conveyance bringing animal manures into Canada, an infected place within the meaning of the provisions of the Animal Contagious Diseases Act, whenever he shall have reason to believe or to have well founded suspicion that such may be a source of danger as respects the introduction of disease; and the unloading of such car or other land or water conveyance shall be in consequence prohibited until otherwise ordered in accordance with the provisions of the said Act.

HORSES, MULES AND ASSES.

Sec. 23. Horses, mules and asses imported from countries other than the United States, Newfoundland and Mexico, must be accompanied by the certificate of a qualified veterinarian and of the local authority of the district whence they came, that no glanders, *maladie du coït* or other serious infectious or contagious disease affecting horses has existed in said district for a period of six months prior to their shipment.

Sec. 24. Horses, mules and asses imported from countries other than the United States, Newfoundland and Mexico, consigned to Montreal, may be, unless otherwise ordered by the Minister, inspected at that port. Such animals landing at any of the other ports named shall be inspected at such ports.

CATTLE.

Sec. 25. Cattle imported from countries other than the United States, Newfoundland and Mexico, must be accompanied by the certificate of a qualified veterinarian and of the local authority of the district whence they came, that no contagious pleuro-pneumonia, rinderpest or foot and mouth disease has existed in said district for a period of six months prior to their shipment.

Sec. 26. (a) A quarantine of thirty days shall be enforced upon cattle imported from the United Kingdom, to be counted from the date of arrival at the quarantine station.

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- (b) A quarantine of ninety days shall be enforced upon cattle imported from all other countries except the United States, Newfoundland and Mexico, to be counted from the date of clearance of the vessel carrying the same from the port at which they were embarked.

OTHER RUMINANTS.

Sec. 27. Sheep and goats imported from countries other than the United States, Newfoundland and Mexico, must be accompanied by the certificate of a qualified veterinarian and of the local authority of the district whence they came, that no foot and mouth disease has existed in said district for a period of six months prior to their shipment.

Sec. 28. A quarantine of thirty days shall be enforced upon all sheep and goats imported from countries other than the United States, Newfoundland and Mexico, to be counted from the date of clearance of the vessel carrying the same from the port at which they were embarked.

SWINE.

Sec. 29. Swine imported from countries other than the United States, Newfoundland and Mexico, must be accompanied by the certificate of a qualified veterinarian and of the local authority of the district whence they came, that no hog-cholera, swine-plague or foot-and-mouth disease has existed in said district for a period of six months prior to their shipment.

Sec. 30. A quarantine of thirty days shall be enforced upon all swine imported from countries other than the United States, Newfoundland and Mexico, to be counted from the date of clearance of the vessel carrying the same from the port at which they were embarked.

IMPORTATION OF ANIMALS FROM THE UNITED STATES, NEWFOUNDLAND AND MEXICO.

Sec. 31. All animals imported into the Dominion of Canada from the United States, Newfoundland and Mexico, must be accompanied by a statutory declaration or affidavit made by the owner or importer, stating clearly the purpose for which said animals are imported, viz.: whether for breeding purposes, for milk production, for work, for grazing, feeding or slaughter, or whether they form part of settlers' effects, or whether they are entered for temporary stay, as provided by these Regulations.

Sec. 32. Said declaration or affidavit must be presented to the Collector of Customs at the port of entry, who will decide whether the animals are entitled to entry under these Regulations, and who will notify the Veterinary Inspector of the Department of Agriculture in all cases where the Regulations require an inspection to be made.

ANIMALS FROM THE UNITED STATES.

HORSES, MULES AND ASSES.

Sec. 33. The importation of branded or range horses, mules and asses, other than those which are gentle and broken to harness or saddle, is prohibited.

Sec. 34. Horses, mules or asses, shall be inspected, and if so ordered by the Minister, may be detained, isolated, dipped, or otherwise treated, or, in default of such order, where the inspector has reason to believe or suspect that the animals are affected with, or have been exposed to contagious or infectious disease.

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Sec. 35. Horses, mules and asses must be accompanied by:—

- (a) A satisfactory certificate of mallein test dated not more than thirty days prior to the date of entry, and signed by an inspector of the United States Bureau of Animal Industry; or,
- (b) A similar certificate from a reputable veterinarian, provided such certificate is endorsed by an inspector of the said Bureau of Animal Industry; or,
- (c) A similar certificate from an inspector of the Canadian Department of Agriculture.

When not so accompanied, such horses, mules or asses must be submitted to the mallein test either at the quarantine station where entry is made, or, under such restrictions as the Veterinary Director General may prescribe, at point of destination.

Sec. 36. When tested at the port of entry, if any reactors are found they shall be slaughtered without compensation, or definitely marked and returned to the United States, and must not again be presented for entry. All horses, mules or asses in the same consignment shall be returned to the United States, but the non-reactors may be again presented for entry and further test after the lapse of a period of not less than fifteen days from the date of the first test, provided that satisfactory evidence is produced to the effect that they have not, during the said period, been in contact with affected animals. When tested at destination points, all animals reacting to the test will be slaughtered without compensation, while those comprising the rest of the shipment will be detained in quarantine until it is shown to the satisfaction of the Veterinary Director General that they are free from disease.

Sec. 37. No compensation will, under any circumstances, be paid for horses reacting to mallein within six months after the date of their importation into Canada.

CATTLE.

Sec. 38. All cattle shall be inspected, and if so ordered by the Minister, may be detained, isolated, submitted to the tuberculin test, dipped or otherwise treated, or in default of such order, where the inspector has reason to believe or suspect that animals are affected with or have been exposed to contagious or infectious disease.

Sec. 39. Cattle for breeding purposes and milk production six months old or over, if unaccompanied by a satisfactory tuberculin test chart dated not more than thirty days prior to the date of entry and signed by a veterinarian of the United States Bureau of Animal Industry, must be detained in quarantine for one week or such further period as may be deemed necessary, and subjected to the tuberculin test; cattle reacting thereto must be returned to the United States or slaughtered without compensation.

Sec. 40. Importers may be required to furnish a statutory declaration that the chart produced applies to the cattle it purports to describe and no other.

OTHER RUMINANTS.

Sec. 41. All sheep and goats shall be inspected, and, if so ordered by the Minister, may be detained, isolated, dipped or otherwise treated, or, in default of such order, where the inspector has reason to believe or suspect that the animals are affected with or have been exposed to contagious or infectious disease.

SWINE.

Sec. 42. All swine must be accompanied by a certificate signed by a veterinarian of the United States Bureau of Animal Industry, stating that neither swine plague nor hog cholera has existed within a radius of five miles of the premises in which they have been kept for a period of six months immediately preceding the date of

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shipment, but such swine shall nevertheless be inspected, and shall be subjected to a quarantine of thirty days before being allowed to come in contact with Canadian animals.

ANIMALS FOR EXHIBITION.

Sec. 43. Animals other than swine may be admitted on inspection at quarantine and inspection ports only, for purposes of exhibition or other temporary stay, subject to the usual Customs regulations.

ANIMALS FOR TRANSIT THROUGH CANADA.

Sec. 44. Animals may be admitted from any part of the United States into Canada for transit to any other part of the United States in bond, and (with the exception of swine) will be admitted to Canada in bond for transit to any Canadian port for exportation by sea to Europe or elsewhere. Such animals are to be subject to inspection at the Canadian port of shipment.

Sec. 45. The transit of such animals shall be subject to such regulations as the Minister shall, from time to time, prescribe.

ANIMALS FROM MEXICO.

Sec. 46. Any person contemplating the importation of animals from Mexico must, in addition to all other requirements of this order, first obtain from the Minister a permit therefor.

Applications for such permits shall be in writing, and shall state the number and kind of animals to be imported, the district and state in Mexico whence they are to be shipped and the probable date of their arrival at and the name of the Canadian port of entry. The statements contained therein may be required to be verified on oath, the Minister deciding in every case whether a permit will be granted.

MEXICAN ANIMALS BONDED THROUGH UNITED STATES TERRITORY FOR ADMISSION TO CANADA.

Sec. 47. Animals passing in bond through United States territory for importation into Canada must be accompanied by a certificate of health signed by a veterinarian of the United States Bureau of Animal Industry, and by an affidavit from the owner or importer that the said certificate refers to the animals in question. Such animals shall nevertheless be subject to inspection, and if necessary to detention, before being permitted to enter Canadian territory. If found diseased such animals are to be subject to and dealt with according to the orders of an inspector under instructions from the Veterinary Director General.

HORSES, MULES AND ASSES.

Sec. 48. The importation of branded or range horses, mules and asses other than those which are gentle and broken to harness or saddle is prohibited.

Sec. 49. All horses, mules and asses shall be inspected and shall be submitted to the mallein test before being allowed to enter Canada. If any reactors are found they shall be slaughtered without compensation.

CATTLE.

Sec. 50. All cattle shall be inspected and if so ordered by the Minister may be detained, isolated, submitted to the tuberculin test, dipped or otherwise treated, or, in default of such order where the inspector has reason to believe or suspect that animals are affected with or have been exposed to contagious or infectious disease.

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OTHER RUMINANTS.

Sec. 51. All sheep and goats shall be inspected, and if so ordered by the Minister may be detained, isolated, dipped or otherwise treated, or, in default of such order, where the inspector has reason to believe or suspect that the animals are affected with or have been exposed to contagious or infectious disease.

SWINE.

Sec. 52. All swine shall be inspected and shall be subjected to a quarantine of sixty days before being allowed to come in contact with Canadian animals.

ANIMALS FROM NEWFOUNDLAND.

Sec. 53. All animals imported from Newfoundland shall be inspected and if so ordered by the Minister, may be detained, isolated, tested, dipped or otherwise treated, or, in default of such order, where the inspector has reason to believe or suspect that animals are affected with or have been exposed to contagious disease.

REGULATIONS OF QUARANTINE.

Sec. 54. Quarantine stations shall be under the care and subject to the orders of the officers appointed for that purpose hereinafter referred to as superintendents, who shall have the general superintendence and control of the servants or other persons, and of all other matters connected therewith.

Sec. 55. Animals in any quarantine station shall be treated and dealt with under the direction of the superintendent of the said station and all articles used for, about or in connection with the said animals shall be in like manner subject to his direction and supervision.

Sec. 56. Cattle six months old or over imported from countries other than the United States, Newfoundland and Mexico shall not be discharged from quarantine until they have been submitted to the tuberculin test by the superintendent of the quarantine or other duly authorized officer.

Sec. 57. Cattle reacting to the tuberculin test, but not showing clinical symptoms, shall be permanently marked in the right ear with the letter 'T' by the officer making the test, and may then be released at the expiry of the prescribed period of quarantine if found free from all other infectious or contagious diseases.

Sec. 58. Cattle showing clinical symptoms of tuberculosis shall be destroyed or otherwise disposed of as the Minister may direct.

Sec. 59. The Minister or the Veterinary Director General may authorize the destruction of any quarantined animal or all or any portion of the articles used in the care of the said animals, and such destruction shall take place under the supervision of the superintendent, and in the manner prescribed by him.

Sec. 60. The expenses of feeding, treating and caring for animals detained in quarantine, with the exception of those for the use of grounds and shelters, shall be borne by the owner or importer, and such expenses shall be paid before the animals are permitted to leave the quarantine, and in default of such payment within fourteen days after the expiration of the period of quarantine, the superintendent may, on fourteen day's notice in writing, delivered or sent by mail to the owner or importer, cause the said animals to be sold to meet the said expenses, together with the expenses of and incidental to the sale of the said animals, the balance, if any, to be handed over to the owner.

Sec. 61. No animal under quarantine shall be allowed to come in contact with any Canadian animal until duly discharged from quarantine.

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Sec. 62. No animal under quarantine shall be removed from a quarantine station until duly discharged therefrom by the superintendent or other duly authorized officer.

Sec. 63. No person shall remove or attempt to remove any animal from a quarantine station without the authority of the superintendent or other duly authorized officer.

Sec. 64. No indemnity shall be allowed for any injury or loss sustained in connection with any animals while detained in quarantine.

EXPORTATION.

Sec. 65. Canadian animals for transit to any shipping port of the United States for export by sea to Europe or elsewhere, must be inspected at such places in Canada as the Minister may, from time to time designate; must not be shipped from the place of inspection until they have been certified by a duly authorized veterinary inspector to be free from infectious and contagious disease and otherwise fit for export, and must not be permitted by collectors of customs to leave Canada unless accompanied by such certificate.

Sec. 66. Animals for exportation by sea should, if possible, reach the port of exportation not less than twelve hours before shipment for rest and inspection. Animals failing to do so shall be liable to detention in the discretion of the inspector.

Sec. 67. Inspectors shall at all times have full power to detain animals for such time as they consider sufficient to enable them to make a thorough and satisfactory inspection and to ascertain that all the provisions of these Regulations relating thereto have been duly observed and complied with.

Sec. 68. Owners or persons in charge of animals for exportation shall give twenty-four hours notice, addressed to the inspector at his office, stating the number and kind of such animals and the expected time of their arrival at the port of exportation.

Sec. 69. No animals except as hereinafter provided, shall be permitted to be placed on board any steamship or other vessel for exportation at any Canadian port until they have been inspected and approved by a duly authorized veterinary inspector at such port and certified by him to be free from contagious disease and in every way fit for export; such inspection to be made within twenty-four hours of embarkation.

Sec. 70. For the purpose of carrying out these Regulations, inspectors shall have free access to any wharf, vessel, car or to any place where animals may be found.

Sec. 71. All inspections for export must be made in daylight.

Sec. 72. Owners or shippers of stock during the progress of inspection at any port of exportation shall, with the means at their disposal, give every required assistance to the inspector at such port, and move the animals according to his directions. In case the owner or shipper refuses or neglects to furnish the necessary assistance, the inspector may employ men at the cost of the owner or shipper, and such cost shall be paid to the inspector before a clean bill of health is given.

Sec. 73. Any unauthorized interference with animals after inspection, whether by substitution or otherwise, or any other evasion, or misrepresentation, will be deemed a breach of these Regulations.

Sec. 74. Inspectors may, if they deem it advisable for purposes of identification, mark animals inspected by them. A certificate of inspection, stating the name of the owner, the number, sex and class of animals in the consignment and certifying to their freedom from contagious disease, will be furnished by the inspector, and must be produced to the Collector of Customs before embarkation.

Sec. 75. Such animals as may have been exposed to contagious or infectious disease or affected with or suspected of being affected with contagious or infectious

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disease, shall be detained and dealt with according to the orders of the inspector under instructions from the Veterinary Director General.

Sec. 76. Inspectors may reject animals for any reasonable cause.

Sec. 77. The Minister may from time to time order that the provisions of these Regulations requiring the inspection and certification as aforesaid, may be waived when in his opinion such action is necessary and desirable.

Sec. 78. The Collector of Customs of any port in Canada whence animals are exported shall not give a clearance to any ship having animals on board for exportation, other than those exempted by ministerial order under the provisions of the preceding section, without having produced to him a certificate, signed by an inspector, to the effect that the animals therein referred to are free from contagious and infectious disease and in every way fit for shipment.

INFECTED VESSELS.

Sec. 79. Vessels which have carried cattle, sheep or other ruminants, among any of which 'foot and mouth disease' shall have been found, shall be prohibited, for a period of sixty days thereafter, from loading cattle, sheep or other ruminants or swine, in any Canadian port; and, further, until such vessel shall have been thoroughly cleansed and disinfected, under the supervision of an inspector or other duly authorized officer.

CUSTOMS OFFICERS.

Sec. 80. Collectors of Customs throughout Canada shall see that the various exigencies and requirements of the present order, or any ministerial or other order made thereunder, are fulfilled before granting any permit which requires before it is given, any act to be performed or any inspection or other proceeding to be made or taken, and they shall see that the prohibitions prescribed and rules established by this order as hereinbefore mentioned, and the instructions which may be issued by the Minister, are obeyed, and in case of any infraction of the provisions of the present order, or any of them, taking place, they shall report at once to the Minister the nature and extent of such infraction.

GENERAL PROVISIONS.

Sec. 81. To provide against the possibility of diseased animals being carried from place to place, through Canadian territory, or conveyed to and shipped from ports, it is ordered as follows:—

An inspection of animals may be made at any place or time by any veterinary inspector under authority from the Veterinary Director General.

Sec. 82. Such animals as may be found affected with or to have been exposed to contagious or infectious disease shall be dealt with according to the provisions of the Animal Contagious Diseases Act.

Sec. 83. On infectious or contagious disease of animals being discovered on board any steamship, vessel or car, or in any stable, shed, yard or other place, it shall be the duty of the inspector, on the removal of the infected animal or animals, to superintend the thorough disinfection of such steamship, car, stable, shed, yard or other place, without loss of time, in a manner satisfactory to an inspector.

Sec. 84. All yards, stables, sheds or other premises used by railway or steamship companies or other persons, for the accommodation of animals shall be maintained in a clean, comfortable and sanitary condition and shall be subject at all times to inspection by inspectors acting under the authority of the Minister, who, when they

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deem such action necessary, may order the cleansing and disinfection in a satisfactory manner of the said yards, stables, sheds or other premises as provided in the Animal Contagious Diseases Act.

Sec. 85. In the event of any owner, lessee or occupant of any yard, stable, shed or other premises or any railway or steamship company or person refusing or neglecting to carry out the orders of the inspector in regard to cleansing and disinfection as aforesaid or in the event of such owner, lessee or occupant, company or person neglecting to maintain his or its yards, stables, sheds or other premises for the use of animals, in a clean, comfortable and sanitary condition, the inspector may condemn the said premises as unfit for use, whereupon the said premises shall not be used for the accommodation of animals until such time as the orders of the inspector in regard thereto have been satisfactorily carried out.

Sec. 86. Stock cars or other vehicles used for the conveyance of live stock shall be cleansed and disinfected at such times and places as the Minister may order. Such disinfection shall be done by the thorough cleansing of the car and its subsequent whitewashing with lime and carbolic acid in the proportion of 1 pound commercial carbolic acid to 5 gallons of lime-wash or such other process as may be approved by the Veterinary Director General.

Sec. 87. Any inspector may at any time when he deems such action necessary or advisable, order any steamship, steam, or other vessel, railway car, or other vehicle, used for the conveyance of animals to be cleansed and disinfected to his satisfaction, as provided by Section 86, at the expense of the person or company owning or operating same, and may prohibit the use or removal of such vessel, car, or other vehicle, until his orders in regard to cleansing and disinfection have been properly carried out. Shippers may refuse to place their animals on any unclean or unsanitary vessel, car or other vehicle and may lodge a complaint with the nearest inspector, who, if he deems such action necessary or advisable, may exercise the powers conferred upon him by this section.

Sec. 88. The Minister may from time to time make such orders, not inconsistent with the provisions of this order as may appear to him necessary or expedient.

Sec. 89. Any person who violates any provision of this order, shall incur the penalties prescribed by the Animal Contagious Diseases Act.

MINISTERIAL ORDER No. 33.

Under and by virtue of the authority conferred upon me by the provisions of the Order in Council of November 30, 1909, containing regulations relating to Animals Quarantine, I do hereby order that:—

1. All stock cars intended for the conveyance of animals from any point in Canada to the United States, or for transit through United States territory to any other part of Canada, must be thoroughly cleansed and disinfected before such animals are placed therein.

2. All cars conveying animals into Canada from the United States, whether such animals are intended for points in Canada or for transit to some other part of the United States, must be inspected, and unless found in a clean and sanitary condition will be returned to the United States.

3. All stock cars, whether of Canadian origin or not, and whether empty or conveying merchandise other than live stock, entering Canada from the United States must, if not already showing evidence of having been so treated, be thoroughly cleansed and disinfected to the satisfaction of an inspector of this department, otherwise they will be returned to the United States.

This provision shall not apply to empty stock cars, bonded and sealed with a customs seal, entering Canada from the United States in transit to some other part of the United States.

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4. Stock cars which have conveyed animals from the United States to points in Canada must be thoroughly cleansed and disinfected immediately after being unloaded, and before being returned to the country whence they came.

5. All hogs entering Canada for transit and all cars conveying such hogs must be inspected by the inspectors of this department immediately after entering Canadian territory. Any cars containing hogs showing evidence of disease, and any cars which are dirty or which do not, in the opinion of the inspector, meet in every way the requirements of the regulations of this department, are to be immediately returned to the United States.

6. All inspections, as provided above, must be made between the hours of 8 a.m. and 4 p.m.; provided that should any railway company furnish artificial lighting and other facilities satisfactory to the department, inspections may be made for such company at any hour, on due notice being given to the inspector on duty for the time being.

7. All cars conveying swine from the United States into Canada intended for transit to some other part of the United States, must be fitted with ten-inch foot boards in a manner satisfactory to the inspectors of this department.

8. The practice of douching or drenching with water United States hogs, or cars containing United States hogs, while in transit through Canada is strictly prohibited.

9. United States hogs while in transit through Canada must not be unloaded from cars containing them on any pretext whatever.

10. Any animal dying from any cause whatever when in transit through Canada from one point in the United States to another in that country, must not be removed from the car in which it died while in Canadian territory.

(Signed) GEO. F. O'HALLORAN,

DEPARTMENT OF AGRICULTURE,
OTTAWA, December 1, 1909.

Deputy Minister of Agriculture.

MINISTERIAL ORDER No. 34.

Under and by virtue of the authority conferred upon me by the provisions of the Order in Council of November 30, 1909, containing regulations relating to Animals Quarantine, I do hereby order that:—

1. All range cattle entering Canada from the United States except for transit in bond, shall be detained at the port of entry, and dipped or otherwise treated to the satisfaction of an inspector.

2. In cases where dipping or treatment is not performed by owners or importers at their own expense, inspectors are authorized to charge the actual cost of treatment, with a maximum charge of 25 cents for each animal so treated.

3. Cattle accompanied by a certificate from an inspector of the United States Bureau of Animal Industry stating that they are not affected with and have not been exposed to the contagion of mange, or that they have, within the thirty days preceding the date of their arrival at the Canadian boundary, been dipped or otherwise treated in a manner satisfactory to the officers of the said Bureau of Animal Industry, may be admitted without treatment.

4. The above order shall not apply to domestic cattle the property of settlers or others, which have not been in contact with animals affected or suspected of being affected, and which, on inspection, show no evidence of being themselves affected with mange.

(Signed) GEO. F. O'HALLORAN,

DEPARTMENT OF AGRICULTURE,
OTTAWA, December 1, 1909.

Deputy Minister of Agriculture.

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MINISTERIAL ORDER No. 35.

Under and by virtue of the authority conferred upon me by the provisions of the Order in Council of November 30, 1909, containing regulations relating to Animals Quarantine, I do hereby order that:—

1. All Canadian animals intended for export to Europe via United States ports must be inspected by a regularly appointed veterinary inspector of this department, and must not be permitted to leave Canada unless accompanied by a certificate of the said inspector to the effect that they are free from contagious and infectious disease, and otherwise fit for export.

2. Shipments of such animals originating in, or passing through Toronto, must be inspected in Toronto.

3. Shipments routed via Montreal, other than those accompanied by a certificate of veterinary inspection at Toronto, must be inspected at Montreal.

4. Shipments not inspected at Toronto or Montreal must be inspected and certified in a similar manner by a regularly appointed veterinary inspector at the place of crossing the international boundary.

5. Railway companies handling animals for export via United States seaports must furnish facilities for unloading, inspection and reloading of animals at boundary points, and except at places specially mentioned above, must give due notice of intended shipments, so as to ensure prompt inspection and the avoidance of delay.

6. All inspections must be made by daylight.

(Signed) GEO. F. O'HALLORAN,
Deputy Minister of Agriculture,

DEPARTMENT OF AGRICULTURE,
OTTAWA, December 1, 1909.

MINISTERIAL ORDER No. 36.

Under and by virtue of the authority conferred upon me by the provisions of the Order in Council of November 30, 1909, containing regulations relating to Animals Quarantine, I do hereby order that:—

1. All sheep originating in that part of the province of Ontario lying west and south of a line commencing at the southeast corner of the county of Ontario, thence in a northerly direction along the eastern boundary of the said county to the north-east corner thereof, thence in a westerly direction along the northern boundary of the said county to the Severn river, thence along the Severn river to the Georgian Bay; as also all sheep originating in Manitoulin island, or any of the other Canadian islands in Lake Huron, must, if consigned to points in the United States, whether intended for export to Europe or not, be inspected by a regularly appointed veterinary inspector of this department.

2. Shipments of such sheep originating in or passing through Toronto, not routed via Montreal, may be inspected in Toronto.

3. Shipments routed via Montreal must be inspected at Montreal.

4. Shipments not inspected at Toronto or Montreal must be inspected and certified in a similar manner by a regularly appointed veterinary inspector at the place of crossing the international boundary.

5. Railway companies handling sheep for export from Ontario to the United States must furnish proper facilities for the unloading, inspection and reloading of sheep at boundary points, and except at the places specially mentioned above, must give due notice of intended shipments, so as to ensure prompt inspection and the avoidance of delay.

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6. All inspections must be made by daylight.

7. This order shall not apply to sheep for breeding, grazing or feeding which are accompanied by a certificate signed by a Canadian official veterinarian stating that no contagious disease affecting sheep has existed in the district in which the animals have been kept for six months preceding the date of exportation, or by a certificate signed by a regularly appointed inspector of this department stating that the animals have been twice dipped in one of the official dips approved by the Secretary of the United States Department of Agriculture.

(Signed) GEO. F. O'HALLORAN,

Deputy Minister of Agriculture.

DEPARTMENT OF AGRICULTURE,
OTTAWA, December 1, 1909.

MINISTERIAL ORDER No. 37.

Under and by virtue of the authority conferred upon me by the provisions of the Order in Council of November 30, 1909, containing regulations relating to Animals Quarantine, I do hereby order that:—

1. All empty stock cars arriving at or passing through any of the places herein-after mentioned shall, unless bearing evidence of having previously been so treated, be cleansed and disinfected under the supervision of an inspector before being allowed to proceed:—

Halifax, N.S.; St. John, N.B.; Montreal, Que.; Toronto, Ont.; Winnipeg, Man.; Moosejaw, Sask.; Medicine Hat, Lethbridge, Calgary, Edmonton and Strathcona, Alta.; Cranbrook, Nelson, Revelstoke and Vancouver, B.C.

(Signed) GEO. F. O'HALLORAN,

Deputy Minister of Agriculture.

DEPARTMENT OF AGRICULTURE,
OTTAWA, December 1, 1909.

MINISTERIAL ORDER No. 40.

Under and by virtue of the authority conferred upon me by section 41 of the Regulations relating to Animals Quarantine, authorized by Order in Council of date the 30th November, 1909, I do hereby order that all sheep imported to Canada from the United States for purposes other than immediate slaughter shall be admitted only at quarantine and not at inspection stations.

1. Such sheep, unless accompanied by a satisfactory certificate signed by an inspector of the United States Bureau of Animal Industry, stating that they have been twice dipped in one of the preparations approved by the said Bureau, shall be subjected to a quarantine of thirty days.

2. During such period of quarantine if the inspector has reason to believe, or suspect that they are affected with, or have been exposed to, the infection of sheep scab he may order them to be twice dipped at the expense of the owner or importer at an interval of not less than ten nor more than fifteen days in a dip officially authorized by this Department for such purpose.

3. Sheep imported for immediate slaughter shall be inspected, and, if found healthy, may be permitted to proceed to destination, but all such sheep shall be subject to the direction and supervision of the inspectors of this Department who shall

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have full power to deal with them in such manner as will effectually prevent their being brought, prior to slaughter, into direct or indirect contact with any Canadian sheep.

4. Inspectors may, under the authority of this Order, take such steps not inconsistent with the Animal Contagious Diseases Act, or the regulations made thereunder, as may appear to them necessary or advisable in order to prevent the possibility of spreading the infection of sheep scab.

(Signed) A. L. JARVIS,
Acting Deputy Minister of Agriculture.

DEPARTMENT OF AGRICULTURE,
OTTAWA, July 20, 1911.

REGULATIONS RELATING TO GLANDERS.

By Order in Council dated 25th March, 1905, as amended May 23rd, 1908, in virtue of "The Animal Contagious Diseases Act, R.S.C., 1906."

1. No animal which is affected with or has been exposed to Glanders shall be permitted to run at large or to come in contact with any animal which is not so affected.

2. Any Veterinary Inspector may declare to be an infected place within the meaning of the "Animal Contagious Diseases Act, R.S.C., 1906," any steamship, or steam or other vessel, or any place or premises where the contagion of Glanders is known or suspected to exist.

3. No horse, mule or ass shall be removed out of an infected place without a license signed by an Inspector.

4. Veterinary Inspectors are hereby authorized to inspect and subject to the mallein test any horses, mules or asses affected with Glanders or suspected of being so affected or which have been in contact with animals so affected or suspected of being so affected, or which have been in any way whatsoever exposed to the contagion or infection of the disease of Glanders, and for the purpose of making such inspection or test to order any such animals to be collected, detained or isolated.

5. Horses, mules or asses affected with Glanders, whether such animals show clinical symptoms of the disease, or react to the mallein test without showing such symptoms, shall on an order signed by a duly appointed Inspector of the Department of Agriculture, be forthwith slaughtered and the carcasses disposed of as in such order prescribed, compensation to be paid to the owners of such animals if and when the Act so provides.

6. In the event of the owner objecting to the slaughter of animals which react to mallein, but show no clinical symptoms of Glanders, the Inspector may order such animals to be kept in close quarantine and re-tested, such re-tests, however, in no case to exceed two in number and to be completed within twelve months of the first test, provided, however, that owners deciding to have their animals quarantined rather than slaughtered shall forfeit all right to compensation.

7. Horses, mules or asses reacting to the third test with mallein shall be forthwith slaughtered on an order signed by an Inspector and the carcasses disposed of as ordered.

8. Inspectors are hereby authorized to permit owners of horses, mules or asses which give no reaction to the third test with mallein and which have at no time shown any clinical symptoms of Glanders, to retain and use such animals subject to the conditions contained in the license signed by the Inspector.

9. Before an order is made for the payment of compensation in any of the cases aforesaid, there must be produced to the Minister of Agriculture a satisfactory report,

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order for slaughter, certificate of valuation and slaughter, and certificate of cleansing and disinfection, all signed by an Inspector.

10. The certificate of an Inspector to the effect that an animal has reacted to the mallein test or has shown clinical symptoms of Glanders, shall for the purpose of the said Act and of this order be *prima facie* evidence in all Courts of Justice and elsewhere, of the matter certified.

11. Every yard, stable, outhouse or other place or premises, and every wagon, cart, carriage, car or other vehicle, and every utensil or other thing infected with Glanders shall be thoroughly cleansed and disinfected by and at the expense of the owner or occupier, in a manner satisfactory to a Veterinary Inspector.

REGULATIONS RELATING TO MALADIE DU COÏT.

By Order in Council dated 22nd July, 1911, in virtue of the Animal Contagious Diseases Act, R.S.C., 1906.

1. No animal which is affected, or suspected of being affected with *Maladie du Coït* shall be permitted to run at large or to come in contact with any animal which is not so affected, and no such animal shall, in any case, be used for breeding purposes.

2. Any inspector may declare to be an infected place within the meaning of "The Animal Contagious Diseases Act," any common, field, stable, or other place or premises where animals are found which are affected or suspected of being affected with *Maladie du Coït*.

3. No horse, ass or mule shall be removed out of any place so declared to be an infected place without a license signed by an Inspector.

4. The Veterinary Director General may, from time to time, order the slaughter, castration or other disposition of animals affected with *Maladie du Coït*.

5. Inspectors are hereby authorized to inspect any animals affected with *Maladie du Coït*, or suspected of being so affected or which have been in contact with animals so affected, or suspected or being so affected, or which have been in any way whatever exposed to the infection of *Maladie du Coït*, and may order any such animals to be collected, detained, isolated, castrated, or otherwise dealt with as may to them appear advisable.

6. The expenses of, and incidental to the collection of, isolation, seizure, castration, or otherwise dealing with animals for the purposes of these Regulations, shall be borne by the owners of the animals, and no indemnity shall be allowed to the owner in case of damage arising out of or resulting from such actions, except as herein-after provided.

7. No entire horse, ass or mule nor any ridgling more than one year old shall be permitted to run at large on unfenced lands in the Province of Alberta or in that portion of the Province of Saskatchewan lying west of the third principal meridian.

8. Any entire horse, ass or mule or any ridgling more than one year old found running at large within the area defined above may be seized and held on the order of any duly authorized Veterinary Inspector of the Department of Agriculture, who shall forthwith whenever possible notify the owner of the said animal of such seizure, and the said animal, if not claimed within thirty days of such seizure, may be castrated, and no indemnity shall be allowed to the owner in case of damage arising out of or resulting from said castration, seizure or detention.

9. Animals affected with *Maladie du Coït*, may on an order signed by a duly appointed Veterinary Inspector acting under special instructions from the Veterinary Director General, be forthwith slaughtered, and the carcasses disposed of as in such order provided, and compensation may be paid to the owners of such animals if and when the Act so provides.

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10. Before an order is made for the payment of compensation in any of the cases aforesaid there must be produced to the Minister of Agriculture a satisfactory report, order for slaughter, and certification of valuation and slaughter, all signed by an Inspector.

REGULATIONS RELATING TO ANTHRAX.

By Order in Council dated 22nd July, 1911, in virtue of the Animal Contagious Diseases Act, R.S.C., 1906.

1. No animal which is affected with or has been exposed to the contagion of Anthrax shall be permitted to run at large or to come in contact with any animal not so affected or exposed.

2. Any inspector may declare to be an infected place within the meaning of the "Animal Contagious Diseases Act" any place or premises where the contagion of Anthrax is known or suspected to exist.

3. No animal nor any portion or product thereof shall be removed out of any place so declared to be an infected place without a license signed by an Inspector.

4. Inspectors are hereby authorized to inspect any animals affected with Anthrax, or suspected of being so affected, or which have been in contact with animals so affected, or suspected of being so affected or which have been in any way whatever exposed to the infection of Anthrax, and may order any such animals to be collected, detained, isolated, or otherwise dealt with as may to them appear advisable.

5. The expenses of, and incidental to the collection, isolation, seizure, or otherwise dealing with animals for the purpose of these Regulations shall be borne by the owners of the animals and no indemnity shall be allowed to the owner in case of damage arising out of or resulting from such actions except as hereinafter provided.

6. Where a Veterinary Inspector so orders no animal or animals shall be allowed access to any field, common, yard, stable, or other place or premises where Anthrax exists or has existed.

7. Carcases of animals dying from Anthrax, or suspected Anthrax, must not be skinned, or cut in any way; such carcases together with all litter, excreta and other articles which may have been in contact with them, must be dealt with in accordance with the orders of the Veterinary Inspector and in a manner satisfactory to him.

8. Premises on which animals affected with Anthrax have been kept are to be dealt with at the expense of the owner or occupier, in a manner satisfactory to the Veterinary Inspector.

9. Animals affected with Anthrax or which have been in contact with or in close proximity to animals affected with Anthrax, may, on an order signed by a Veterinary Inspector, duly appointed under the Animal Contagious Diseases Act, be forthwith slaughtered and the carcases disposed of as in such order prescribed, compensation to be paid to the owners of such animals if and when the Act so provides, but no Inspector shall order the slaughter of such animals without having first received from the Minister special authority to do so.

10. Before an order is made for the payment of compensation in any of the cases aforesaid there must be produced to the Minister of Agriculture a satisfactory report, order for slaughter, certificate of valuation and slaughter, and certificate of cleansing and disinfection, all signed by an Inspector.

11. Any Inspector may declare any steamship, steam or other vessel, railway car or other vehicle, on or in which animals affected with or suspected of being affected with Anthrax, are or have been placed for the purpose of transit, to be infected, and may also declare such vessel, car or other vehicle, to be no longer

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infected after it has been thoroughly cleansed and disinfected in accordance with his instructions

12. Every yard, stable, cowshed, outhouse, or other place or premises, and every wagon, cart, carriage, car, or other vehicle, and every utensil or other thing infected or suspected of being infected with Anthrax shall be thoroughly cleansed and disinfected by and at the expense of the owner or occupier in a manner satisfactory to an Inspector.

REGULATIONS RELATING TO HOG CHOLERA AND SWINE PLAGUE.

By Order in Council dated 8th June, 1911, in virtue of "The Animal Contagious Diseases Act," R.S.C., 1906.

1. No hog which is or has been affected with, or which has been exposed to hog cholera or swine plague, shall be permitted to run at large, or to come in contact with any hog which is not so affected.

2. Any Inspector may declare to be an infected place, within the meaning of the Animal Contagious Diseases Act, any place or premises where the infection of hog cholera or swine plague is known or suspected to exist.

3. No hog or other animal, nor any portion or product thereof, shall be removed out of a place so declared to be an infected place, without a license signed by an Inspector.

4. Inspectors are hereby authorized to inspect any hogs affected with hog cholera or swine plague, or suspected of being so affected, or which have been in contact with animals so affected or suspected of being so affected, or which have been in any way whatsoever exposed to the contagion of hog cholera or swine plague, and for the purpose of making such inspection may order any such animals to be collected, detained or isolated.

5. The expenses of, and incidental to the collection, isolation, seizure, or otherwise dealing with animals for the purpose of these Regulations shall be borne by the owners of the animals, and no indemnity shall be allowed to the owner in case of damage arising out of or resulting from such actions, except as hereinafter provided.

6. Hogs affected with cholera or swine plague, or which have been in contact with or in close proximity to hogs affected with hog cholera or swine plague, shall on an order signed by an Inspector duly appointed under the Animal Contagious Diseases Act be forthwith slaughtered and the carcasses disposed of as in such order prescribed, compensation to be paid to the owners of such animals if and when the Act so provides.

7. After any place or premises has been declared to be an infected place on account of the existence or suspected existence thereon of hog cholera or swine plague, no hogs shall be brought on to such place or premises, except with the authority of an Inspector, until the said place or premises shall have been declared to have been free from infectious or contagious disease, as provided in Section 20 of the Animal Contagious Diseases Act, and in case of the infraction of this Regulation any compensation to which the owner might otherwise be entitled shall be withheld.

8. Compensation may be withheld in the case of hogs fed on uncooked garbage or kitchen refuse, or on any raw animal flesh or similar food likely to convey the infection of hog cholera or swine plague.

9. Before an order is made for the payment of compensation in any of the cases aforesaid there must be produced to the Minister of Agriculture a satisfactory report, order for slaughter, certificate of valuation and slaughter, and certificate of cleansing and disinfection, all signed by an Inspector.

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10. Every yard, stable, hog-pen, or other place or premises, and every wagon, cart, carriage or other vehicle, and every utensil or other thing infected or suspected of being infected with hog cholera or swine plague shall be thoroughly cleansed and disinfected by and at the expense of the owner or occupier in a manner satisfactory to an Inspector.

REGULATIONS RELATING TO MANGE.

By Order in Council dated 22nd July, 1911, in virtue of the Animal Contagious Diseases Act, R.S.C., 1906.

1. No animal which is affected or has been exposed to the infection of Mange shall be permitted to run at large or to come in contact with any animal not so affected or exposed.

2. Any Inspector may declare to be an infected place within the meaning of the "Animal Contagious Diseases Act," any place or premises where the infection of Mange is known or suspected to exist.

3. No animal nor any portion or product thereof shall be removed out of any place so declared to be an infected place without a license signed by an Inspector.

4. Inspectors are hereby authorized to inspect any animals affected with Mange or suspected of being so affected, or which have been in contact with animals so affected, or suspected of being so affected or which have been in any way whatever exposed to the infection of Mange, and may order any such animals to be collected, detained, isolated, dipped, or otherwise dealt with, as may to them appear advisable.

5. The expense of and incidental to the collection, isolation, seizure, or otherwise dealing with animals for the purpose of these Regulations shall be borne by the owners of the animals and no indemnity shall be allowed to the owner in case of damage arising out of, or resulting from such actions except as hereinafter provided.

6. Where a Veterinary Inspector so orders, no animal or animals shall be allowed access to any field, common, yard, stable or other place or premises where Mange exists or has existed.

7. Premises on which animals affected with Mange have been kept are to be dealt with at the expense of the owner, in a manner satisfactory to the Veterinary Inspector.

8. Animals affected with Mange or which have been in contact with, or in close proximity to animals affected with Mange, may, on an order signed by a Veterinary Inspector, duly appointed under the "Animal Contagious Diseases Act," be forthwith slaughtered and the carcasses disposed of as in such order prescribed, compensation to be paid to the owners of such animals if and when the Act so provides, but no Inspector shall order the slaughter of such animals without having first received, from the Minister, special authority to do so.

9. Before an order is made for the payment of compensation in any of the cases aforesaid, there must be produced to the Minister of Agriculture a satisfactory report, order for slaughter, certificate of valuation and slaughter, and certificate of cleansing and disinfection, all signed by an Inspector.

10. Any inspector may declare any steamship, steam or other vessel, railway car or other vehicle, on or in which animals affected with or suspected of being affected with Mange are or have been placed for the purpose of transit, to be infected, and may also declare such vessel, car or other vehicle, to be no longer infected after it has been thoroughly cleansed and disinfected in accordance with his instructions.

11. Every yard, stable, cowshed, or other place or premises, and every wagon, cart, carriage, car, or other vehicle, and every utensil or other thing infected or suspected of being infected with Mange shall be thoroughly cleansed and disinfected by, and at the expense of the owner or occupier in a manner satisfactory to an inspector.

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SPECIAL MANGE ORDER FOR ALBERTA AND SASKATCHEWAN.

By Order in Council dated 8th June, 1911.

Whereas the disease of Mange exists among cattle throughout those portions of the Provinces of Saskatchewan and Alberta which may be described as bounded by the International Boundary, the Rocky Mountains and a line drawn as follows:—

A line from the Rocky Mountains along the northern boundary of the Stony Indian Reserve to the line between ranges 5 and 6 west of the 5th meridian, thence north along that line to the line between townships 40 and 41, thence east along that line to the 4th principal meridian, thence south along the 4th principal meridian to the Red Deer River, thence along the Red Deer and Saskatchewan rivers to the line between ranges 7 and 8 west of the 3rd meridian, thence south along that line to the International boundary.

Therefore, His Excellency in Council is pleased, in virtue of the provisions of Chapter 75, of the Revised Statutes of Canada, 1906, to order that the annexed regulations relating to Mange in cattle in certain portions of the Provinces of Saskatchewan and Alberta, shall be and the same are hereby established.

REGULATIONS.

CATTLE FOR SHIPMENT OUTSIDE THE AREA FOR PURPOSES OTHER THAN IMMEDIATE SLAUGHTER.

1. Cattle intended for grazing, feeding, breeding purposes or milk production, or any purposes other than immediate slaughter shall not be removed or be allowed to move out of the above described tract, nor shall any railway company accept or load any such cattle for shipment, unless they are accompanied by the certificate of a regular salaried Veterinary Inspector of the Department of Agriculture stating that they are free from disease and that they have been, within a period of thirty days immediately preceding the date of shipment, treated under the supervision of a regular salaried Veterinary Inspector and in a manner satisfactory to him, and that they have not, since being so treated, been exposed either directly or indirectly, to the contagion of Mange.

CATTLE FOR IMMEDIATE SLAUGHTER OUTSIDE THE AREA OR FOR EXPORT TO EUROPE.

2. Cattle intended for immediate slaughter or for export to Europe shall not be removed or allowed to move out of the above described tract nor shall any railway company accept or load any such cattle for shipment, except under the following conditions:—

(a) Cattle, other than those consigned to Winnipeg or to points in Canada east of Winnipeg, shall be removed or allowed to move out of the above described tract, either by rail or otherwise, only when accompanied by the certificate of a Veterinary Inspector of the Department of Agriculture, stating that they have been examined by him and have been found free from infection of Mange and other contagious disease.

(b) Cattle, consigned to Winnipeg or to points in Canada east of Winnipeg, whether originating within the above described tract or not, shall be inspected at Winnipeg, and no railway company shall release such cattle at Winnipeg, or load such cattle for re-shipment therefrom, until they have been submitted by daylight to a Veterinary Inspector of the Department of Agriculture and certified by him to be free from Mange and other contagious disease.

(c) Cattle found on inspection to be affected with Mange or other contagious or infectious disease shall, except as hereinafter provided, be dealt with as may be ordered by the Veterinary Inspector.

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INFECTED CATTLE FOR IMMEDIATE SLAUGHTER WITHIN THE AREA.

3. Cattle showing evidence of Mange, originating in a place which has been declared to be an infected place, may be removed therefrom for shipment by rail for slaughter at a given destination within the quarantined area only, in the judgment of a regular salaried Veterinary Inspector who, if he sees fit, may issue a license for such removal, as provided in Section 23 of the Animal Contagious Diseases Act.

4. In the event of any cattle affected with Mange but which have not originated in a place declared to be an infected place being presented for shipment by rail, such cattle, together with any others with which they have been in contact, shall be immediately detained and isolated, or may, if the Veterinary Inspector sees fit, be shipped, under the conditions hereinafter set forth, to a slaughter house within the area properly equipped as hereinafter provided, for immediate slaughter only. The Veterinary Inspector shall immediately report the matter to the nearest regular salaried Veterinary Inspector of the Department who shall thereupon take such further action as may appear to him to be necessary.

5. The loading of the above classes of cattle must be personally supervised by an inspector who must see that the cars conveying them are duly billed to a slaughter house as above provided and that the said cars bear the placard required by Section 7 of this Order.

(a) The inspector at the point of shipment shall also notify by telegraph the inspector at the point of destination of the fact that the cattle are being forwarded.

(b) Unless loaded through special yards and chutes reserved exclusively for such shipments, all yards and chutes, weigh-scales or other appliances with which they have been in contact shall be declared infected places and shall not again be used until cleansed and disinfected to the satisfaction of an inspector; such cattle shall not be allowed to come in contact with other animals; shall be consigned direct only to such slaughter houses within the hereinbefore described tract as are provided with private yards and chutes; shall not be unloaded at any point en route, and *shall under no pretext whatever, be removed alive from the slaughter house or the yards and premises immediately connected therewith.*

GENERAL PROVISIONS REGARDING SHIPMENT.

6. All waybills and bills of lading accompanying shipments of cattle originating within the said tract, other than those shipped under the provisions of Section 1 of this Order shall have plainly written or stamped across the face thereof a notification that the cars conveying such shipments are to be cleansed and disinfected after being unloaded, and before being again used.

7. All cars conveying such cattle must bear a placard having clearly printed thereon, in letters not less than six inches long, the words "*cattle for immediate slaughter only.*" Such cards shall in no case be removed unless and until the cars have been cleansed and disinfected after being unloaded at final destination.

(a) When cattle shipped to United States points are transferred to United States cars, such cars shall also bear a similar placard, but the placards shall not be removed from the Canadian cars unless and until the cars have been cleansed and disinfected under official supervision.

8. At points where cattle originating in the said tract, other than those provided for in Section 1 of this Order, are unloaded they shall be placed in special yards, and such yards shall be used for no other purpose and shall be cleansed and disinfected when so ordered by an inspector.

9. Cars conveying such cattle shall be cleansed and disinfected to the satisfaction of an inspector after being unloaded and before being again used.

10. Cattle shipped for immediate slaughter or for export shall not be sold or otherwise disposed of for any other purpose.

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THE TRANSIT OF CATTLE THROUGH THE AREA.

11. The transit of cattle through the said tract is permitted, subject to the following regulations:—

(a) Cattle passing by rail through the said tract from one part of Canada to another, shall, at points where unloading is necessary, be placed in yards specially reserved for this purpose, and *shall not be permitted to come either directly or indirectly in contact with cattle which have originated within the said tract*, other than those provided for in Section 1 of this Order.

(b) Cattle imported from the United States into the said tract destined for points in Canada outside thereof may, under compliance with the Quarantine Regulations, and with the provisions of the next preceding paragraph hereof, be permitted to pass without unnecessary delay through the said tract direct to their destination without further restrictions.

12. Any infraction of these provisions shall be deemed an infraction of the Animal Contagious Diseases Act and dealt with accordingly.

13. The Minister is hereby empowered to make such alterations in the boundaries of the quarantined area defined by this Order as may from time to time seem to him necessary or advisable.

SPECIAL MANGE ORDER FOR BRITISH COLUMBIA.

By Order in Council dated 8th June, 1911, as amended by Ministerial Order July 5th, 1911.

Whereas the disease of Mange exists among cattle throughout that portion of the Province of British Columbia which may be described as bounded by a line drawn as follows:—

Beginning at the mouth of the North Thompson River, thence north along the said river to the line between townships 22 and 23, thence easterly along the line between townships 22 and 23, to the northwest corner of township 22, range 11, thence south along the line between ranges 11 and 12 to the southern boundary of the railway belt, thence westerly along the southern boundary of the railway belt to the line between ranges 17 and 18, thence northerly along the line between ranges 17 and 18, to the South Thompson River, thence east along the South Thompson River to the place of beginning.

Therefore His Excellency in Council, in virtue of the provisions of Chapter 75 Revised Statutes of Canada, 1906, is pleased to make and establish the following regulations relating to Mange in cattle in certain portions of the Province of British Columbia, and the same are hereby made and established accordingly.

REGULATIONS.

1. Cattle intended for grazing, feeding, breeding purposes or milk production, or any purpose other than immediate slaughter, shall not be removed or be allowed to move out of the above described tract, nor shall any railway company accept or load any such cattle for shipment, unless they are accompanied by the certificate of a regular salaried Veterinary Inspector of the Department of Agriculture stating that they are free from disease and that they have been, within a period of thirty days immediately preceding the date of shipment, treated under the supervision of a regular salaried Veterinary Inspector and in a manner satisfactory to him, and that they have not, since being so treated, been exposed either directly or indirectly to the contagion of mange.

2. Cattle intended for immediate slaughter shall not be removed or allowed to move out of the above described tract, nor shall any railway company accept or load

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any such cattle for shipment, unless they are accompanied by the certificate of a Veterinary Inspector of the Department of Agriculture, stating that they have been examined by him and found free from mange or other contagious disease.

3. The inspector at the point of shipment shall notify by telegraph the inspector at the point of destination of the fact that the cattle are being forwarded.

4. Cattle found on inspection to be *affected with mange* shall not be removed or permitted to move out of the above described tract *under any pretext whatever*, except that by the authority and under the supervision of a Veterinary Inspector of the Department of Agriculture, such cattle may be moved to points within the area *for immediate slaughter*.

5. Such cattle shall not be allowed to come in contact with other animals; shall be consigned direct only to such slaughter houses within the hereinbefore described tract as are provided with private yards and chutes; shall not be unloaded at any point en route, and shall *under no pretext whatever, be removed alive from the slaughter house or the yards and premises immediately connected therewith*.

6. When cattle are shipped for immediate slaughter they shall not be sold or otherwise disposed of for any other purpose.

7. All way-bills and bills-of-lading accompanying shipments of cattle originating within the said tract, other than those shipped under the provisions of Section 1 of this Order, shall have plainly written or stamped across the face thereof a notification that the cars conveying such shipments are to be cleansed and disinfected after being unloaded, and before being again used.

8. All cars conveying such cattle must bear a placard having clearly printed thereon in letters not less than six inches long, the words "*cattle for immediate slaughter only*." Such cards shall in no case be removed unless and until the cars have been cleansed and disinfected after being unloaded at final destination.

9. Unless loaded through special yards and chutes, reserved exclusively for such shipments, all yards and chutes, weigh-scales and other appliances with which they have been in contact shall be declared to be infected places, and shall not again be used until cleansed and disinfected to the satisfaction of an inspector of the Department of Agriculture.

10. Cars conveying such cattle shall be cleansed and disinfected to the satisfaction of an inspector after being unloaded and before being again used.

11. Cattle for transit by rail through the said tract from one part of Canada to another, shall, at points where unloading is necessary, be placed in yards specially reserved for this purpose, and shall not be permitted to come in contact with cattle which have originated within the said tract, other than those provided for in Section 1 of this Order.

12. Any infraction of these provisions shall be deemed an infraction of the Animal Contagious Diseases Act and dealt with accordingly.

13. The Minister is hereby empowered to make such alterations in the boundaries of the quarantined area defined by this Order as may from time to time seem to him necessary or advisable.

SPECIAL ORDER REGARDING THE MOVEMENT OF HORSES IN ALBERTA AND SASKATCHEWAN.

By Order in Council of 19th August, 1911.

Whereas certain contagious diseases exist among horses in those portions of the provinces of Saskatchewan and Alberta which may be described as bounded by the International Boundary, the Rocky Mountains and a line drawn as follows:—

A line from the Rocky Mountains along the northern boundary of the Stoney Indian Reserve to the line between ranges 5 and 6 west of the 5th meridian, thence

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north along that line to the line between townships 40 and 41, thence east along that line to the 4th principal meridian, thence south along the 4th principal meridian to the Red Deer river, thence along the Red Deer and Saskatchewan rivers to the line between ranges 7 and 8 west of the 3rd meridian, thence south along that line to the International Boundary.

And whereas it is advisable and in the public interest, with a view to eradicating the disease, that regulations be established for this purpose.

Therefore His Excellency in Council is pleased to make and establish the following regulations and the same are hereby made and established accordingly.

REGULATIONS.

1. No horse, except as hereinafter provided, shall be removed or allowed to move out of the said tract unless and until it has been examined by a Veterinary Inspector of the Department of Agriculture and certified to be free from contagious disease.

2. All horses which are intended to be removed or to be allowed to move out of the hereinbefore described tract, except as hereinafter provided, shall be inspected, and if found diseased or to have been in contact with diseased horses shall be dealt with in accordance with the provisions of the Animal Contagious Diseases Act and of the regulations made thereunder.

3. No railway company shall accept or load for shipment from or to any point, either within or without the said tract, any horses which have originated therein unless such horses are accompanied by the certificate of an inspector of the Department of Agriculture, as above provided.

4. All cars and other vehicles used for the carriage of horses originating within the said tract shall be cleansed and disinfected to the satisfaction of an inspector as soon as possible after being unloaded and before being used for any other shipment.

5. All way-bills and bills-of-lading accompanying shipments of horses originating within the said tract shall have plainly written or stamped across the face thereof, a notification that the said cars are to be cleansed and disinfected immediately after being unloaded.

6. The transit of horses through the said tract is hereby permitted subject to the following regulations:—

(a) Horses for transit by rail through the said tract from one part of Canada to another, shall, at points where unloading is necessary, be placed in yards reserved for their exclusive use, and *shall not be permitted to come in contact with horses which have originated within the said tract.*

(b) Horses imported from the United States into the said tract destined for points in Canada outside thereof, may, upon compliance with the quarantine regulations and with the provisions of the next preceding section hereof, be permitted to pass, without unnecessary delay, through the said tract direct to their destination, without further restrictions.

7. Any infraction of these provisions shall be deemed an infraction of the Animal Contagious Diseases Act and dealt with accordingly.

8. The Minister is hereby empowered to make such alterations in the boundaries of the quarantined area defined by this Order as may from time to time seem to him necessary or advisable.

REGULATIONS RELATING TO SHEEP SCAB.

By Order in Council dated 22nd July, 1911, in virtue of the Animal Contagious Diseases Act, R.S.C., 1906.

1. No sheep which is affected with or has been exposed to the infection of Sheep Scab shall be permitted to run at large or to come in contact with any animal not so affected or exposed.

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2. Any inspector may declare to be an infected place within the meaning of the "Animal Contagious Diseases Act" any place or premises where the infection of Sheep Scab is known or suspected to exist.

3. No sheep nor any wool or other portion or product thereof shall be removed out of any place so declared to be an infected place without a license signed by an inspector.

4. Inspectors are hereby authorized to inspect any sheep affected with Sheep Scab, or suspected of being so affected, or which have been in contact with animals so affected, or suspected of being so affected or which have been in any way whatever exposed to the infection of Sheep Scab, and may order any such animals to be collected, detained, isolated, dipped or otherwise dealt with as may to them appear advisable.

5. The expenses of, and incidental to the collection, isolation, seizure, or otherwise dealing with animals for the purposes of these Regulations, shall be borne by the owners of the animals and no indemnity shall be allowed to the owner in case of damage arising out of or resulting from such actions except as hereinafter provided.

6. Where a Veterinary Inspector so orders, no sheep shall be allowed access to any field, common, yard, stable, or other place or premises where Sheep Scap exists or has existed.

7. Premises on which animals affected with Sheep Scab have been kept, are to be dealt with at the expense of the owner, or occupier in a manner satisfactory to the Veterinary Inspector.

8. Animals affected with Sheep Scab or which have been in contact with or in close proximity to animals affected with Sheep Scab, may, on an order signed by a Veterinary Inspector, duly appointed under the Animal Contagious Diseases Act, be forthwith slaughtered and the carcasses disposed of as in such order prescribed, compensation to be paid to the owners of such animals if and when the Act so provides, but no inspector shall order the slaughter of such animals without having first received from the Minister special authority to do so.

9. Before an order is made for the payment of compensation in any of the cases aforesaid there must be produced to the Minister of Agriculture a satisfactory report, order for slaughter, certificate of valuation and slaughter, and certificate of cleansing and disinfection, all signed by an Inspector.

10. Any Inspector may declare any steamship, steam, or other vessel, railway car or other vehicle, on or in which animals affected with or suspected of being affected with Sheep Scab, are or have been placed for the purpose of transit, to be infected, and may also declare such vessel, car or other vehicle, to be no longer infected after it has been thoroughly cleansed and disinfected in accordance with his instructions.

11. Every yard, stable, cow shed, outhouse, or other place or premises, and every waggon, cart, carriage, car or other vehicle, and every utensil or other thing infected or suspected of being infected with Sheep Scab shall be thoroughly cleansed and disinfected by and at the expense of the owner or occupier in a manner satisfactory to an Inspector.

REGULATIONS RELATING TO RABIES.

By Order in Council dated 10th August, 1905, as amended 28th. May, 1909, in virtue of "The Animal Contagious Diseases Act," R.S.C., 1906.

1. No dog or other animal which is affected with or has been exposed to the infection of Rabies, shall be permitted to run at large, or to come in contact with other animals.

2. Any Veterinary Inspector may declare to be an infected place within the meaning of "The Animal Contagious Diseases Act, R.S.C., 1906," any place or premises where the infection of Rabies is known or suspected to exist.

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3. Veterinary Inspectors are hereby authorized to order the slaughter of any dog or other animal affected with Rabies, or suspected of being so affected, and to order the disposition of the carcass of such animal.

4. Veterinary Inspectors are hereby authorized to order dogs or other animals, which have been exposed to the infection of Rabies, to be detained, isolated or muzzled.

5. No dog or other animal, nor any part thereof, shall be removed out of an infected place without a license signed by an Inspector.

6. Every yard, stable, or outhouse, or other place or premises, and every wagon, cart, carriage, car or other vehicle, and every vessel and every utensil or other thing infected or suspected of being infected with Rabies, shall be thoroughly cleansed and disinfected by and at the expense of the owner or occupier in a manner satisfactory to a Veterinary Inspector.

7. On receiving the report of an Inspector to the effect that Rabies is known or suspected to exist in any locality, the Minister of Agriculture may order that all dogs, or other animals, within such an area as he may determine or describe, shall be detained, isolated or muzzled in such manner and during such period as he may see fit.

REGULATIONS RELATING TO TUBERCULOSIS.

By Orders in Council dated 23rd December, 1904, and 30th November, 1909, in virtue of "The Animal Contagious Diseases Act, 1903," (R.S.C., 1906).

1. The disease of Tuberculosis is hereby exempted from the operation of Sections 3, 4, 11, 36, 37 and 38 of the "Animal Contagious Diseases Act, 1903" (R.S.C., 1906).

2. Cattle which have re-acted to the tuberculin test shall be deemed to be affected with Tuberculosis, and shall be permanently marked, in such manner as the Veterinary Director General may, from time to time, prescribe.

3. Cattle which have re-acted to the tuberculin test, shall not be permitted to be exported from the Dominion of Canada.

REGULATIONS RELATING TO ACTINOMYCOSIS.

By Orders in Council dated 23rd December, 1904, and 20th March, 1911, in virtue of "The Animal Contagious Diseases Act, 1903" (R.S.C., 1906).

1. The disease of Actinomycosis is hereby exempted from the operation of Sections 3, 4, 11, 36, 37 and 38 of the "Animal Contagious Diseases Act, 1903" (R.S.C., 1906).

2. No animal affected with Actinomycosis shall be exported from the Dominion of Canada.

APPENDIX No. 16.

AN ACT RESPECTING THE INSPECTION OF MEATS AND CANNED FOODS, AS AMENDED MAY 4, 1910.

His Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:—

1. This Act may be cited as *The Meat and Canned Foods Act*.

2. In this Act, unless the context otherwise requires,—

(a) 'carcases' means the carcasses of cattle, sheep, swine, goats, game or poultry;

(b) 'establishment' means any abattoir, packing house, or other premises in which such animals are slaughtered, or in which any parts thereof or products thereof, or fish, or fruit, or vegetables, are prepared for food for export or are stored for export;

(c) 'export' means export out of Canada, or out of any province to any other province thereof;

(d) 'food' includes every article used for food or drink by man, and every ingredient intended for mixing with the food or drink of man for any purpose;

(e) 'inspector' means an inspector appointed under this Act;

(f) 'Minister' means the Minister of Agriculture;

(g) 'regulations' means regulations made under the provisions of this Act;

(h) 'a farmer' is a person whose recognized occupation is that of farming, and who slaughters only such animals as are fed by him on his own premises.

3. All animals intended for slaughter in any establishment shall be inspected as provided by the regulations.

(2) No animal shall be allowed to enter the parts of an establishment where slaughtering is carried on, unless it has undergone such inspection.

(3) Every animal affected, or suspected of being affected, with contagious or other disease, shall be slaughtered under the supervision of the inspector and be disposed of as provided by the regulations.

4. All carcasses and portions thereof of all animals, wherever slaughtered, intended for export, shall be inspected as provided by the regulations.

5. Unless the Minister otherwise directs, upon the report of an inspector, animals owned by farmers and slaughtered by them on their own premises, shall not be subject to inspection under the provisions of this Act.

6. Every carcass, or portion thereof, found to be healthy and fit for food, shall be marked by an inspector in such a manner as is provided by the regulations; and the carcass, or portion thereof, may then be dealt with as the owner thereof sees fit, subject to the further supervision of the inspector.

7. Every carcass or portion or product thereof prepared for food in any establishment and packed in cans or similar receptacles, or in any package whatever, shall be subject to inspection during the whole course of preparation and packing; and after all the requirements of this Act regarding inspection have been complied with, and not until then, all such packages shall be marked by an inspector in such manner as is provided by the regulations.

8. The inspector may at any time re-inspect a carcass, or any portion or product thereof, in order to ascertain whether, subsequently to the first inspection thereof, it has undergone decomposition, or has otherwise deteriorated, or has been tampered with or adulterated by the use of preservatives or otherwise.

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(2) Every carcass, or portion or product thereof sent out of an establishment, and returned thereto for any purpose, shall not be again sent out therefrom without re-inspection.

9. Every carcass, or portion or product thereof, found, upon inspection or re-inspection, to be unhealthy or unfit for food, or which contains such ingredients or preservatives as may render it unfit for food, shall be marked by the inspector in such manner as is provided by the regulations, and shall thereupon be deemed to be condemned as unfit for food and shall be disposed of as provided by the regulations.

10. Any person slaughtering, or permitting the slaughtering of, animals and selling, or offering for sale or transportation for food purposes, for export a carcass, or any portion or product thereof, which is unhealthy or unfit for food, is guilty of an indictable offence and liable to one year's imprisonment.

(2) Every one who is convicted of this offence after a previous conviction for the same crime shall be liable to two years' imprisonment.

11. The Governor in Council may, upon application of the owner thereof, exempt any establishment from the operation of the provisions of sections 3 and 4, and of sections 6 to 10, both inclusive, of this Act.

12. All articles prepared for food in any establishment and packed in cans or similar receptacles, or in any package whatever, shall be subject to inspection during the whole course of preparation and packing; and all such packages shall be marked with,—

(a) the initials of the Christian names, the full surname, and the address, or, in the case of a firm or corporation, the firm or corporate name and address, of the packer or of the first dealer obtaining them direct from the packer, who sells or offers the said articles for sale; and such dealer shall, upon the request of an inspector appointed under this Act, disclose the name of the packer of such article;

(b) a true and correct description of the contents of the package:

Provided, however, that if it be established to the satisfaction of the Governor General in Council that such marking would hinder the sale of any of said articles in foreign markets or in the markets of the United Kingdom, he may exempt such articles from the provisions of this section.

13. All fish, fruit, or vegetables used in any establishment where these articles are prepared for export, shall be sound, wholesome, and fit for food; and any such articles or products thereof found in the said establishment unsound or unwholesome shall be confiscated and destroyed as provided by the regulations.

14. An inspection and close supervision of the sanitary conditions of all establishments shall be maintained, and they shall be conducted under such conditions, sanitary and otherwise, as may be prescribed by the regulations.

2. The inspector shall refuse to inspect or mark articles in any establishment where the sanitary conditions are not in accordance with the regulations.

15. In the event of the provisions of this Act, or any regulations, or the lawful instructions of an inspector not being complied with in any establishment, the Minister may withdraw the inspector therefrom, and may refuse to it the inspection, marking, and certification of the articles prepared therein, and may cause the establishment to be closed.

15a. No person shall offer or expose or have in his possession for sale any article subject to inspection under this Act, unless all the requirements thereof respecting the said article have been complied with.

16. No person shall offer or accept for export, or shall export, any articles subject to inspection under this Act, unless its requirements regarding inspection and marking have been complied with in respect to such articles.

Every person offering any carcass, or portion or product thereof, for export, or exporting such carcass, portion or product, shall furnish such proof as is required

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by the regulations as to whether the articles so offered for export, or exported, are subject to inspection or not.

(2) No clearance shall be granted to any vessel carrying any carcases, or any portions or products thereof, unless they are duly marked in accordance with the provisions of this Act.

(3) The provisions of this section shall not apply to meats intended for consumption on board the vessels by which they are shipped from a Canadian port.

(4) At the request of the owner of any establishment, the inspector in charge thereof shall issue certificates of inspection for any carcases or portions or products thereof intended for export. Such certificates shall be in such form as is provided by the regulations.

(5) Notwithstanding anything in this section, the Governor in Council may, whenever it is deemed necessary or advisable to do so, authorize the export of any such article without inspection.

17. No article subject to inspection under this Act shall be offered or sold for export, or exported, under any name intended or calculated to deceive as to its true nature.

(2) No package containing any article subject to inspection under this Act shall be marked with any label, brand, or mark which falsely represents the quantity or weight or contents of such package.

(3) No package containing any article subject to inspection under this Act shall be marked with any label, brand, or mark which falsely represents the date when the articles or goods contained therein were packed.

18. Every person who, without authority, wilfully and wrongfully uses or imitates any mark, tag, label or certificate placed on or attached to any article in accordance with the provisions of this Act or of any regulation made thereunder, and every person who wilfully and wrongfully removes, alters, effaces or obliterates, or causes to be removed, altered, effaced or obliterated, wholly or partially, any such mark, tag, label or certificate, shall incur a penalty of one hundred dollars.

19. The Minister may appoint inspectors and other officers for the carrying out of the provisions of this Act, but such appointments shall be confirmed by the Governor in Council within thirty days of the date thereof.

(2) No person shall be appointed as a veterinary inspector until he has passed such examination as is deemed necessary by the Governor in Council.

20. The Governor in Council may make such orders and regulations, not inconsistent with the provisions of this Act, as to him seem necessary for the carrying out of the provisions of this Act.

(2) Such orders and regulations shall have the same force and effect as if embodied in this Act.

(3) Every such order or regulation shall be published twice in *The Canada Gazette*.

(4) Any such order or regulation may be proved by the production of a copy thereof certified by the Minister; and such order or regulation shall, until the contrary is proved, be deemed to have been duly made and issued on the date thereof.

21. The certificate of an inspector or other officer appointed under this Act, or any mark applied under this Act, shall, for the purposes of this Act, be prima facie evidence of the matter which it purports to establish.

22. Any inspector or other officer appointed under this Act may, at any time, for the purpose of carrying into effect any provision of this Act, enter any place or premises, or any steamship, vessel or boat, or any carriage, car, truck, horse-box or other vehicle used for the carriage of articles subject to the provisions of this Act and may require to be produced for inspection, or for the purpose of obtaining copies thereof or extracts therefrom, any books, shipping bills, bills of lading or other

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papers, but shall, if required, state in writing the grounds for his action in so doing.

23. Every person who refuses to admit, or who obstructs or impedes, an inspector or other officer acting in execution of this Act, or of any order or regulation made by the Governor in Council or the Minister thereunder, and every person who aids and assists him therein, shall, for every such offence, incur a penalty not exceeding five hundred dollars; and the inspector or other officer may apprehend the offender and take him forthwith before a justice of the peace to be dealt with according to law; but no person so apprehended shall be detained in custody, without the order of the justice, longer than twenty-four hours.

24. Every person who moves, or causes or allows to be moved, any animal, or any article in violation of the provisions of this Act, shall, for every such offence, incur a penalty not exceeding five hundred dollars.

25. The provisions of *The Criminal Code* respecting the bribery and corruption of officials or employees of the Government extend to all inspectors and other persons appointed to carry out the provisions of this Act.

26. Every person who violates any provision of this Act, or of any regulation made by the Governor in Council or by the Minister under the authority of this Act, in respect to which no penalty is hereinbefore provided, shall for every such offence, incur a penalty not exceeding five hundred dollars.

27. Any inspector or constable may, without warrant, apprehend any person found committing an offence against the provisions of this Act, and shall take any person so apprehended forthwith before a justice of the peace to be examined and dealt with according to law; but a person so apprehended shall not be detained in custody, without the order of a justice, longer than twenty-four hours; and any inspector or constable may require that any animal or any article moved in violation of the provisions of this Act be forthwith taken back within the limits of the place whence it was moved, and may enforce and execute such requisition at the expense of the owner of such animal or article.

28. Every offence against this Act, or against any order or regulation of the Governor in Council or of the Minister, shall for the purposes of proceedings under this Act, or of such order or regulation, be deemed to have been committed, and every cause of complaint under this Act, or any such order or regulation, shall be deemed to have arisen, either in the place in which it actually was committed or arose, or in any place in which the person charged or complained against happens to be.

29. Every penalty imposed by this Act shall be recoverable, with costs, before any two justices of the peace, or any magistrate having the powers of two justices of the peace, under Part XV. of *The Criminal Code*.

30. The administration of any part of this Act may be assigned by the Governor in Council to any Minister other than the Minister of Agriculture, and in such case the Minister to whom such assignment is made shall have the same powers with respect to the part of this Act to him assigned as the Minister of Agriculture now has.

REGULATIONS GOVERNING THE INSPECTION OF MEATS.

By Orders in Council, August 1, 1910, and November 12, 1910.

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SUBJECT.

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2. Application of Regulations.
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6. Relations of inspectors and managers of establishments.
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8. Conduct of inspectors.
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13. 'Detention' and 'Condemned' rooms to be provided.
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REGULATIONS GOVERNING THE INSPECTION OF MEATS.—BY ORDERS
IN COUNCIL, AUGUST 1, 1910, AND NOVEMBER 12, 1910.

1. In these regulations, unless the context otherwise requires,—

(a) 'the Act' means the 'Meat and Canned Foods Act';

(b) 'the Minister' means the Minister of Agriculture;

(c) 'the Department' means the Department of Agriculture;

(d) 'carcases' means the carcases of cattle, swine, sheep, goats, game or poultry;

(e) 'establishment' means any abattoir, packing-house, or other premises in which such animals are slaughtered, or in which any parts thereof or products thereof are prepared for food for export, or are stored for export;

(f) 'export' means export out of Canada or out of any province to any other province thereof;

(g) 'food' includes every article used for food or drink by man, and every ingredient intended for mixing with the food or drink of man for any purpose;

(h) 'inspector' means an inspector appointed under the Act;

(i) 'farmer' is a person whose recognized occupation is that of farming and who slaughters only such animals as are fed by him on his own premises;

(j) 'regulations' means regulations made under the provisions of the Act;

(k) 'portions' means the usual cuts, known as sides, quarters, shoulders, hams, bellies, &c., and also entire organs, such as tongues, livers, hearts, &c.;

(l) 'product' means anything prepared from carcases or portions;

(m) 'Canada Approved' means that carcases, portions, or edible products so marked have been inspected and found fit for food;

(n) 'Rejected' means that carcases or portions so marked may be rendered into lard or tallow;

(o) 'Condemned' means that carcases, portions, or products so marked are unfit for food, and shall be destroyed for food purposes;

(p) 'Inspection Legend' means the Crown, the words 'Canada Approved,' and the establishment number;

(q) 'package' means any can or other container in which carcases, portions, or products are packed, or any box, basket, or other receptacle used for their transportation, or anything in which products are wrapped up or bound together.

2. The following regulations, so far as they affect establishments, shall not apply to any establishment within the meaning of the Act other than those in which animals are slaughtered, or carcases, portions, or products thereof are prepared for food for export, or stored for export.

3. Every animal slaughtered, and all carcases, portions, or products thereof, prepared for food purposes in an establishment, shall be inspected and dealt with as required in these regulations.

4. The Minister may assign to each establishment under inspection a number which, together with the Crown and the words 'Canada Approved,' shall constitute the Inspection Legend for such establishment.

In the case of establishments having one or more branches, the Minister may assign to each branch establishment the same number, with the addition of a serial letter.

5. At establishments for which inspection is provided the Minister shall assign an inspector to take charge of the inspection, together with such assistants as he may deem necessary.

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Inspectors shall, when in the performance of their duties, wear a numbered badge provided by the Department.

6. Establishments at which inspection is maintained shall furnish suitable accommodations for inspectors, such accommodations to include the exclusive use of a room, or rooms, suitable for office purposes, together with such fittings, sanitary or otherwise, as may be required for the proper conduct of the business of the Department or the accommodation of the inspectors stationed at such establishment.

The inspector in charge shall be kept fully informed by the management of all details regarding the actual operation of the establishment, and such operation will not be permitted under any circumstances without the knowledge of the inspector in charge, and either under his supervision or that of an inspector detailed by him for that purpose.

Every reasonable arrangement must be made as regards hours of work and other details, for the mutual convenience of the management and the officers of the department.

This provision shall have special reference to small establishments situated in the same town, or in close proximity to each other, when two or more are under the supervision of the same inspector.

7. If the following sanitary conditions are not observed, inspectors are authorized to refuse inspection, and to forbid the removal from the establishment of meat and meat food products. Such action shall be reported immediately to the Veterinary Director General:—

(a) All establishments having inspection shall be suitably lighted and ventilated. All appliances, such as tables, trucks, vats, machines, containers, &c., must be kept clean and sanitary. All steps in the course of production shall be carried on carefully and with strict cleanliness, and under the supervision of an inspector;

(b) Rooms in which carcases, parts, or products thereof are placed or prepared, shall be scraped, scrubbed, whitewashed, or painted at such times and in such manner as may be deemed advisable by the inspector in charge, and shall contain facilities for cleansing all equipment;

(c) The yards or pens belonging to or used in connection with any establishment shall be maintained in a clean, comfortable and sanitary condition, and shall not be used for the fattening of swine or other animals, nor shall any offal or other refuse from the establishment be utilized for feeding purposes;

(d) No carcases or parts thereof entering into the production of food shall be allowed to come in contact with anything that will contaminate or deteriorate them;

(e) Dressing rooms and lavatory accommodation shall be ample, sanitary and fully equipped, and shall be entirely apart from any room or compartment used for the storing or production of food;

(f) Employees of any establishment engaged in handling foods must be free from tuberculosis or other communicable diseases, and must observe such general rules as to sanitation as may be deemed necessary by the inspector in charge;

(g) Coverings used by employees to protect their clothing or persons shall be of material easily cleaned;

(h) Inspectors in charge of each establishment shall suggest to the manager or owner any needed change in sanitary conditions, and shall report weekly to the Veterinary Director General as to the general observance of this provision.

8. Inspectors must conform to any reasonable rules in force in any establishment in which they may be stationed, such as those prohibiting the use of tobacco on the premises, or other matters of a like nature properly coming under the control of the management. They must refrain from addressing employees except when absolutely necessary, and must at no time detain an employee or engage his attention by unnecessary conversation. Except in case of emergency, all complaints regarding employees, or the manner in which their work is performed, are to be made direct to the management and not to the employees.

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Inspectors must constantly keep in mind the fact that the general conduct of the establishment is not in their hands but in that of the management, and that their official duties begin and end with the proper enforcement of the Act and the regulations.

9. Inspectors in charge of establishments shall furnish to the Veterinary Director General such daily and other reports as may be required.

Proprietors of establishments shall, upon request, furnish to the inspector in charge accurate information regarding receipts of stock, shipments and products on hand. They shall also furnish to the Veterinary Director General such information regarding processes of manufacture and other matters of a like nature as may by that officer be deemed reasonable and necessary in the public interest.

10. No animal which has entered the yards or pens of an establishment shall be removed therefrom unless permission in writing is granted by the inspector in charge.

Every animal about to be slaughtered shall be examined by a veterinary inspector in the yards or pens of the establishment prior to entering the killing floor. Establishments shall provide suitable facilities for separating healthy animals from those showing symptoms of or suspected of being affected with disease.

Only such animals as appear on inspection to be healthy shall be slaughtered at the regular kill.

Animals found to be diseased, or suspected of being diseased, shall be tagged in the left ear with a metal tag bearing the word 'Held,' and killed separately at the end of the regular kill.

Animals known as 'cripples' or 'downers' shall be tagged 'Held,' and may be slaughtered at the regular kill or otherwise, upon permission of the inspector in charge.

11. Inspectors shall make a thorough inspection, at the time of slaughter, of the carcass and all portions thereof. If the examination reveals no grounds for detaining or condemning the same, the inspector shall mark such carcass or portions, as required in section 20.

If the inspector deems it necessary to hold any carcass or part thereof for further examination, he shall mark the same 'Held,' as required in section 14.

Should the re-inspection show the carcass or any part thereof to be in any way unfit for food, the inspector shall at the time of reinspection mark such carcass or portion thereof with a 'Condemned' tag, as provided in section 16, and such carcass or portion shall forthwith be placed in the 'Condemned' room or tanked.

Carcasses which may be rendered into lard or tallow shall be marked 'Rejected,' but only after all diseased parts have been removed, as provided in section 15.

No part of any carcass shall be removed or so placed as to prevent its ready identification, except with the authority of the inspector.

12. The entire carcass, as also the blood, of any animal affected with any of the following diseases or conditions is to be condemned and tanked, or otherwise disposed of as hereinafter provided:—

Anthrax.

Black Leg.

Pyemia or Septicemia.

Rabies.

Tetanus.

Malignant Catarrh.

Hog Cholera.

Swine Plague.

Texas Fever.

Parasitic ictero hematuria.

Inflammation (chronic or acute) of any of the following tissues: Lungs, pleura, intestines, peritoneum or uterus.

Traumatic Pericarditis.

Jaundice.

Uremia.

Abnormal Sexual Smell.

Parturition (carcases of animals having within ten days given birth to young, if showing any signs of septic infection.)

Immaturity. Every animal under three weeks of age.

Tapeworm Cysts.—*Cysticercus Bovis*,

Cysticercus Cellulosæ, except when the infestation is slight, in which case the carcass may be rejected and rendered into lard or tallow.

Emaciation or Anæmia.

(2) Tuberculosis.—Any carcass affected with tuberculosis which is emaciated, or in which the disease is generalized or is found in any of the deep-seated lymphatic glands, or in which the lesions wherever situated, are at all extensive, caseous, or purulent shall be condemned.

(a) When the lesions are collectively small in extent and calcified, or encysted and confined to the head, or to the head and the thoracic and abdominal viscera and their covering and lymphatic glands, the affected parts shall be removed and condemned (except the head, which shall be removed and may, if the inspector so decides, be rejected after removal and condemnation of the lesions); the remainder of the carcass, if well nourished and, in the judgment of the inspector, otherwise healthy, may be passed;

(b) Carcases affected as above, in which the lesions are small but are in a state of caseation, may, if the inspector sees fit, be rejected and rendered into lard or tallow, as provided in section 15 of these regulations, after the diseased portions have been removed and condemned, provided that where the lesions are such as to justify suspicion of extension the inspector shall examine the precural, prescapular and popliteal glands, in addition to those in, or adjacent to the body cavities, and all carcasses in which any of the deep-seated glands are found to be affected shall be condemned.

(3) Actinomycosis and Actinobacillosis. The entire carcass affected with either of these diseases shall be condemned, except when the disease is confined to the seat of primary infection, or is otherwise definitely localized to the satisfaction of the inspector, and the carcass is well nourished and otherwise healthy. Should the head be affected, the whole head, including the tongue, must be condemned. Any other organ in which the disease may be localized, must be condemned.

(4) Carcases or portions showing the following lesions or conditions shall be condemned:—

Abscesses.

Bruises.

Tumours.

Internal parasitic infection.

(5) Any abnormal condition not herein described must be dealt with as the judgment of the inspector directs.

(6) The presence at any establishment of an animal affected with or showing symptoms of any contagious or infectious disease, must be promptly reported to the Veterinary Director General by the inspector in charge, who shall also take immediate steps to ascertain the point of origin and address of former owner, and the place whence such animal was shipped, at the same time taking such further action under the provisions of the 'Animal Contagious Diseases Act' as he may deem necessary and advisable.

(7) Animals in an advanced stage of pregnancy shall be tagged 'Held.' They shall not be slaughtered at that time nor for ten days after parturition, but may be

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removed for stock or dairy purposes, provided they are not affected with and have not been exposed to infectious or contagious disease. Before such animals are released, permission in writing shall be granted by the inspector in charge, and the 'Held' tag removed.

13. In every establishment there shall be set apart special rooms or compartments, one to be known as the 'Detention' room, in which all carcasses, portions or products thereof, marked 'Held,' shall be placed until finally inspected or dealt with. The other room shall be known as the 'Condemned' room, in which shall be placed all carcasses, portions or products thereof, marked 'Condemned.' Both rooms shall be well lighted, and so constructed and situated that they may be easily cleaned and disinfected. The doors shall be so fitted that they may be locked, with locks supplied by the Department, and the inspector shall retain charge of such locks and their keys.

If, after final inspection in the detention room of any carcass or portion marked 'Held,' the same is found fit for food, the 'Held' tag shall be removed, and the carcass, or portion, stamped as required in section 20. Any carcass or portion marked 'Held,' and which on final inspection is found to be unfit for food, shall be marked as provided in these regulations, and removed at once to the 'Condemned' room.

14. If at any time an inspector deems it necessary to further inspect any carcass, portion or product, he shall firmly attach thereto a white paper tag, numbered, and having thereon the word 'Held,' and immediately have the carcass, portion or product so marked placed in the 'Detention' room. In all cases where the inspector making the first examination is not the same individual as the one making the final inspection, the former shall furnish to the latter a description of the animal or article, and the reason for which it was held, together with the number of the 'Held' tag. If, on final inspection or other investigation, the carcass, portion, or product is found fit for food, the 'Held' tag shall be removed and the carcass, portion, or product marked with the Inspection Legend. Should inspection show the same to be unfit for food, it shall be immediately marked as provided, and removed to the 'Condemned' room for final disposition.

Carcasses showing diseased or injured portions which cannot be readily removed at the time of slaughter, shall be marked 'Held,' and placed in the detention room until chilled, when the inspector may, if he sees fit, remove the affected portion and mark it 'Condemned,' and the remainder of the carcass 'Rejected' or 'Canada Approved' as he may decide.

15. Each carcass, or portion thereof, found on inspection or re-inspection, to be unfit for ordinary food purposes, but not unfit to permit of its being rendered into lard or tallow, shall be marked with a numbered red paper tag having thereon the word 'Rejected.'

All carcasses or portions marked 'Rejected' must be cooked by steam at a temperature not lower than 220° F., for not less than four hours.

16. Upon each carcass, portion or product thereof, found on inspection, re-inspection, or during the process of production, to be in any way unfit for food, there shall be placed a black paper tag bearing a number and the word 'Condemned,' and such carcasses, portions, or products shall be immediately placed in the 'Condemned' room, or tanked as provided for in the following section.

All animals found dead, or in dying condition, upon the premises of any establishment, shall be tagged in the right ear, by an inspector, with a metal tag bearing a number and the word 'Condemned.'

Such tag shall under no circumstances be removed, except by the inspector supervising the final disposition of the carcass, portion, or product so marked, who shall report as to its disposition.

17. Every establishment having inspection shall be equipped with facilities satisfactory to the Minister for the tanking of all diseased carcasses, portions, or products. They must be so placed or operated as to cause no odours or fumes to pervade any room wherein carcasses or portions thereof are prepared or stored for food purposes.

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All carcasses, portions, or products which have been marked 'Condemned,' shall be tanked or otherwise disposed of as hereinafter provided, under the supervision of an inspector. Tanks shall be entirely separate and detached from any pipe or conduit leading to or from any tank, pipe, or conduit in which edible products are prepared, conveyed or stored, and shall be sealed, and the seals broken only by an inspector, who shall see that the process of tanking is sufficiently thorough to render impossible the utilization of any of the condemned carcasses, parts, or products in any way for human food.

As a further precaution, with the above object in view, the Minister may authorize the use by inspectors of any colouring or other matter which may be considered suitable.

Establishments which, on being first brought under inspection, do not possess the necessary equipment for tanking, will be granted reasonable time in which to provide the same. Until then, inspectors will slash carcasses, or portions thereof, in such a way as to render them unsaleable and easily identified, and will, in addition, be required to supervise their burning or proper burial.

Notwithstanding anything in this section, inspectors in charge shall at all times have the right, either for official or for scientific or educational purposes, to reserve any carcass, or any portion or product thereof, which has been condemned on account of disease or other abnormal condition, as also to retain, for any of the above purposes, specimens from any carcass, portion, or product which has been rejected.

Any inspector reserving any carcass, or any portion or product thereof, as above provided, must immediately report his action in so doing to the Veterinary Director General.

18. No carcasses or portions thereof, other than those bearing the Inspection Legend and which have been inspected and found fit for food, shall be allowed to enter any establishment at which inspection is maintained, except as hereinafter provided:—

(a) Carcasses, portions, or products thereof shipped from foreign countries, if properly certified, whether by marking or otherwise, to have passed government inspection to the satisfaction of the Minister before leaving the country of origin; but such carcasses, portions, or products shall be re-inspected and dealt with accordingly;

(b) Dressed carcasses which, except in the case of game or poultry, must have the head, heart, lungs and liver held by their natural attachments; such carcasses to be inspected before entering the establishment, and, if found fit for food to be marked with the Inspection Legend; if found to be diseased, or otherwise unfit for food, to be dealt with as provided in the regulations;

(c) Unmarked carcasses or portions, shipped from another establishment at which inspection is maintained, under the provisions of section 26 of these regulations;

(d) Manufactured sausage casings if, upon inspection, they are found to be healthy and fit for human food;

(e) Carcasses of sheep or lambs of any age, or of dressed calves not more than three months old, from which the head has been removed, provided that the heart, lungs and liver are held by their natural attachments;

(f) Carcasses, portions, or products which do not come within the classes already mentioned in this section, shall be permitted entrance to an establishment only in accordance with such special directions or instructions as may be issued by the Minister, but shall in no case be received unless the inspector in charge has been notified;

(g) Carcasses, portions, or products thereof shall be permitted to enter establishments only through such doors, passages, or other means of entrance as are designated for that purpose, and at such times and under such conditions as may be approved by the inspector.

19. Inspectors may at any time re-inspect any carcass, portion, or product thereof which has been prepared, stored in, or returned to any establishment, or is about to

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be shipped therefrom. If upon such re-inspection any carcass, portion, or product is found to be unfit for food, by reason of adulteration or deterioration, or any other cause, it shall be dealt with and disposed of as provided in these regulations.

20. Except when shipped direct to an establishment under inspection, as provided in section 26, every carcass, portion, or product found, upon inspection or re-inspection, to be fit for food, which is to leave the establishment, shall have a stamp or mark showing the Inspection Legend. In the case of such portions or products as cannot be individually marked, the marking shall be placed on the case, package, or container, in such manner as is prescribed in section 25 of these regulations.

21. Sausages, canned meats, and portions intended for cure, shall be prepared only from carcasses or portions which have been marked with the Inspection Legend, or which have been admitted to an establishment in accordance with these regulations, and which on reinspection are found fit for food. Their preparation and packing shall be supervised by an inspector, who shall not allow any fixture, appliance, or receptacle to be used in the production of food products unless the same is clean and sanitary.

No food product shall contain and deleterious substance, drug, dye or preservative.

With the object of preventing the use of deleterious substances, the inspector shall, as often as deemed advisable, procure samples of the preservatives used, as also of the different food products during their preparation, or after they have been prepared, and shall submit them without delay to the department for analysis.

Inspectors in charge will be furnished by the department with the names of harmless preservatives and dyes which may be used; the addition of others will prevent the approval of the product.

22. The proprietor or manager of any establishment shall, upon request of the inspector in charge, furnish to him free of charge any sample or samples of preservatives, food products, or any ingredient used in the preparation of foods. Samples so obtained must be sealed, labelled and marked with a description of the same, together with the inspector's name, and the date, and forwarded at once to the Veterinary Director General.

23. All carcasses, portions, or products of carcasses, prepared for food and packed in cans or similar receptacles, or in any package, shall be subject to inspection during the whole course of preparation and packing; and all such cans or receptacles shall be marked, unless otherwise ordered by the Governor in Council, with:—

(a) The initials of the Christian names, the full surname and the address, or, in the case of a firm or corporation, the firm or corporate name and address, of the packer, or of the first dealer obtaining them direct from the packer who sells or offers the said articles for sale; and such dealer shall, upon the request of an inspector appointed under the Act, disclose the name of the packer of such article.

(b) A true and correct description of the contents of the package.

These requirements shall be embodied on a trade label, stencil, or lithographed design, which shall be of a size reasonably proportionate to the size of the package, duly approved by the Minister, having thereon the Inspection Legend in addition to the name and address of the packer or of the first dealer, as provided above, and description of the contents. All letters and figures in the Inspection Legend shall be of a size reasonably proportionate to the general lettering of the label, stencil, or lithographed design.

No can, receptacle, or package subject to inspection shall be marked with anything which falsely represents the quantity, weight, contents, or date when contents of same were packed.

Owners or managers of establishments shall supply to the Veterinary Director General, for fying purposes, a copy of every label, stencil, or lithographed design used in the establishment.

24. All labels, cans, receptacles, or containers, upon which the name and address of the packer, or first dealer, and the Inspection Legend are stencilled, or otherwise embodied in a permanent manner, shall be under the custody of an inspector.

25. When carcasses, portions or products are shipped from any establishment in any package, case, or covering concealing wholly or partially the contents, the package, case or covering shall be marked in accordance with the requirements of section 23 of these regulations, unless such shipment is being forwarded direct to an establishment under inspection, as provided in section 26, and is covered by a certificate issued by an inspector of the department.

Owners or managers of establishments shall supply all necessary help to affix labels and stamps under the supervision of an inspector.

26. Carcasses, portions, or products, intended for food purposes, may be permitted to leave an establishment under inspection without having been marked as provided in section 20 of these regulations only when such carcasses, portions, or products are consigned direct to another establishment under inspection. Every such shipment must be accompanied by a certificate from the inspector in charge of the establishment of origin, which certificate shall set forth fully the number and nature of the carcasses, portions, or products which it purports to cover, as also the name of the consignee. This certificate shall be made out in triplicate, the original and duplicate to be handed to the common carrier, if any, accepting the shipment, the original to be fyled and the duplicate forwarded to the Veterinary Director General, by the common carrier; in the case of shipments conveyed by wagon or other vehicle from one establishment to another establishment under inspection, the original shall be fyled by the inspector in charge of the establishment forwarding the shipment and the duplicate forwarded by him to the Veterinary Director General. The triplicate in each case shall be sent by the inspector in charge of the establishment in which the shipment originated to the inspector in charge of that to which the consignment was made.

In the case of carload shipments, the certificate shall also show the car number and initials.

All cars, wagons, or other containers used for the conveyance of unmarked meats, as above provided, must be sealed by an inspector in the establishment of origin, and such seals shall be broken only by an inspector.

27. Except as provided in section 37 of these regulations, no clearance shall be granted to any vessel carrying any carcasses, portions, or products thereof, other than ship stores, out of the Dominion, unless said carcasses, portions, or products have been duly marked with the Inspection Legend.

As evidence that this requirement and the provisions of the Act have been complied with, it shall be deemed sufficient if a certificate signed by the inspector in charge of the establishment in which the shipment originated, or by the shipper, has been fyled with the Customs authorities by the master, owner, or agent of the vessel, to the effect that the carcasses, portions, or products have been duly inspected and marked according to the provisions of the Act; such certificate to set forth also the number of carcasses, portions, or packages, weight, description, shipping marks, shipper, consignee and destination.

On request of the owner of an establishment, the inspector in charge shall issue a certificate in triplicate covering any carcasses, portions, or products thereof, which have been inspected and marked with the Inspection Legend, and which are to be exported out of the Dominion. Such certificates shall be issued in serial numbers. The original, duplicate and triplicate shall be given to the shipper, who shall hand them to the transportation company; the original to be attached to the bill of lading accompanying the shipment for the information of the Customs authorities; the duplicate kept on file by the transportation company accepting the shipment; and

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the triplicate forwarded by the transportation company to the Veterinary Director General.

23. When any carcass, portion or product thereof, is offered for transportation, for export, the person, firm, or corporation shipping the same shall fill out a certificate in duplicate in one of the following described forms (unless the shipment is covered by a certificate signed by an inspector, as provided for in sections 26 and 27), which shall be delivered to the common carrier or other person to whom such shipment is offered; and no common carrier or other person shall transport or accept for transportation for export any carcass, portion or product thereof until such certificate in duplicate has been duly made and signed by the shipper or an inspector.

(1) To be used when shipment consists of duly inspected and marked carcasses, or parts or edible products thereof:—

Station.....	Date.....
Name and address of shipper.....	
Name and address of consignee.....	
Name of carrier.....	
I hereby certify that the following described shipment consists of carcasses, parts, of products thereof, which have been duly inspected and marked with the Inspection Legend according to the 'Meat and Canned Foods Act,' and that the articles comprising it have not been tampered with or treated, since they were so marked, in any way other than is allowed by the said Act or the regulations made thereunder, and that they are at this date wholesome and fit for human food.	
No. of packages.....	
Weight	
Description	
Shipping marks	
..... <i>Signature of Shipper.</i>	

(2) To be used when shipment is made by a farmer:—

Station.....	Date.....
Name and address of shipper.....	
Name and address of consignee.....	
Name of carrier.....	
I hereby certify that I am a farmer, and that the following described carcasses or parts thereof are from animals owned by me and slaughtered upon my own premises, and that they are at this date wholesome and fit for human food.	
No. of carcasses or parts.....	
Description	
..... <i>Signature of Shipper.</i>	

(3) To be used when the shipment is of foreign origin, and consists of inspected and marked carcasses, portions, or products thereof, which have passed a government inspection in the country of origin satisfactory to the Minister.

Station.....	Date.....
Name and address of shipper.....	
Name and address of consignee.....	
Name of carrier.....	
I hereby certify that the following described shipment consists of carcasses, parts or products thereof which have been duly inspected in..... (Country of origin)	
and are marked.....	

(Markings)

which is the official export marking of that country, certifying that they have passed government inspection, and that they are at this date, to the best of my knowledge and belief, sound, wholesome and fit for human food.

No. of packages.....
 Weight.....
 Description.....
 Shipping marks.....

Signature of Shipper.

29. All certificates, other than those issued by inspectors, as provided for in sections 26 and 27, shall be made in duplicate; the original shall be filed by the initial carrier and kept on file for at least one year, and the duplicate shall be immediately forwarded by him to the Veterinary Director General.

30. Way-bills, transfer bills, running slips, or conductor's cards, accompanying any shipment of carcasses, portions, or products thereof, shall have stamped thereon, or attached thereto, the following certificate:—

(a) In case of duly inspected and marked carcasses, parts, or edible products:—

'Shipment inspected and marked "Canada Approved," as evidenced by shipper's certificate on file with initial carrier.'

Railroad Company.....

Agent.

(b) In case of shipments made by farmers:—

'Uninspected, as evidenced by shipper's certificate on file with initial carrier.'

Railroad company.....

Agent.

(c) In case of shipments of foreign origin:—

Shipment inspected and marked in.....

(Country of origin.)

as evidenced by shipper's certificate on file with initial carrier.'

Railroad company.....

Agent.

(d) In case of shipments Inspected but not marked:—

'Shipment inspected but unmarked, as evidenced by inspector's certificate on file with initial carrier.'

Railroad company.....

Agent.

31. Nothing in sections 27 or 28 shall apply to sausage casings, carcasses or portions of game or dressed poultry, or to pork and beans, or to mincemeat, which may, unless otherwise ordered, be accepted for transportation, for export, without certification or marking.

32. Notwithstanding anything in these regulations, common carriers may accept, for export, without certification, any animal product not intended for food purposes, provided that each package, cask, or other container is plainly and permanently marked with the following words: 'Inedible. Unfit for food.' Such marking must be distinct and in letters not less than one inch in length.

33. The presence of the Inspection Legend on any carcass, portion, or product thereof shall indicate only that the article so marked was at the time of marking sound, healthy and fit for food, and that, in the case of products, the process of manufacture was conducted under proper sanitary conditions.

34. The words 'Canada Approved' and the Crown, with or without any establishment number, are hereby declared to be a government mark.

35. No person, not being an inspector duly appointed under the Act, or duly authorized by an inspector so appointed, shall apply the Inspection Legend, or the words 'Canada Approved,' or any word or words of like meaning or effect, to any

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carcass, portion or product thereof, or to any article of food, or to any package containing the same.

36. After the contents of any package or covering bearing the Inspection Legend have been removed, no further use of the Legend shall be made, but it shall forthwith be destroyed.

37. The provisions of these regulations with regard to export shall not apply to the shipment of carcasses, portions, or products from any one of the three provinces of Nova Scotia, New Brunswick and Prince Edward Island to any other of the said three provinces, or to Newfoundland, St. Pierre et Miquelon, or the Magdalen Islands.

38. Collectors of Customs throughout Canada shall see that the various exigencies and requirements of these regulations, or any ministerial or other order made thereunder, are fulfilled before granting any permit which requires, before it is given, any act to be performed or any inspection or other proceeding to be made or taken and they shall see that the prohibitions prescribed and rules established by these regulations as hereinbefore mentioned, and the instructions which may be issued by the Minister, are obeyed, and, in case of any infraction of the provisions of these regulations, or any of them, taking place, they shall report at once to the Minister the nature and extent of such infraction.

REGULATIONS GOVERNING THE INSPECTION OF PRESERVED FRUITS, VEGETABLES AND MILK.

(By Order in Council, July 6th, 1910.)

1. In these regulations, unless the context otherwise requires,—

(a) 'The Act' means the Meat and Canned Foods Act;

(b) 'The Minister' means the Minister of Agriculture;

(c) 'The Department' means the Department of Agriculture;

(d) 'establishment' means any factory, cannery, evaporating plant, or other place or premises in which fruits, vegetables, or fruit or vegetable products are processed, canned, bottled, evaporated, dried, or otherwise preserved for food for export, or in which milk is condensed, evaporated, or otherwise preserved for food for export, or in which any of the articles aforementioned are stored for export;

(e) 'export' means export out of Canada, or out of any province to any other province thereof;

(f) 'food' includes every article used for food or drink by man, and every ingredient intended for mixing with the food or drink of man for any purpose;

(g) 'inspector' means an inspector appointed under the Act;

(h) 'regulations' means these regulations made under the provisions of the Act;

(i) 'products' means anything prepared from fruit or vegetables, or any condensed or evaporated milk;

(j) 'container' means any receptacle made of wood, glass, earthenware, or metallic substance, whether hermetically sealed or intended to be so sealed, or otherwise;

(k) 'package' means any can or other container in which products are packed, or any box, basket, or other receptacle used for their transportation, or anything in which products are wrapped up or bound together.

2. These regulations shall apply to all establishments within the meaning of paragraph (d) of section 1 hereof.

3. The Minister may, as provided in the Act, appoint inspectors who shall, from time to time, visit each establishment for the purpose of seeing that the provisions of the Act and of these regulations are duly observed and complied with.

4. Inspectors shall, in the performance of their official duties, wear a numbered badge provided by the department.

5. Inspectors shall furnish to the Veterinary Director General full and detailed reports of all inspections made by them, and of such other matters as may, in the public interest, be deemed necessary or advisable.

6. The following sanitary conditions shall be observed and maintained in all establishments:—

(a) All establishments shall be suitably lighted and ventilated;

(b) All appliances, such as tables, trucks, vats, machines, kettles, containers, &c., shall be kept clean and sanitary;

(c) All operations in connection with the preparation or packing of products shall be carried on carefully, and with strict cleanliness;

(d) Rooms in which articles intended for food are stored, processed, or otherwise prepared, shall be scraped, scrubbed, whitewashed, painted, or otherwise dealt with at such times as may be deemed necessary by an inspector, and shall contain facilities for cleaning all equipment;

(e) Employees of any establishment engaged in handling articles intended for food must be free from tuberculosis or other communicable disease, and must observe such general sanitary rules as may be deemed necessary by the inspector;

(f) No articles entering into the production of food shall be allowed to come in contact with anything that will contaminate or deteriorate them;

(g) Coverings used by employees to protect their clothing or persons shall be of material easily cleaned, and shall be kept reasonably clean;

(h) Dressing rooms and lavatory accommodations shall be ample, sanitary and fully equipped, and shall be entirely apart from any room or compartment used for the storing or production of food or of articles intended for food;

(i) All yards, outhouses, or other premises belonging to or used in connection with any establishment shall be maintained in a clean and sanitary condition, and shall not be used for the emptying or storing of refuse;

(j) The drainage, if any, in connection with establishments shall be ample, and kept in proper working order;

(k) No lavatory, sink, or cesspool shall be so situated or maintained as to permit any odours or fumes therefrom to pervade any room where food or articles intended for food are prepared or stored.

7. All fruits, vegetables, milk, or other articles used in any establishment shall be sound, wholesome, and in every way fit for food.

8. All fruits, vegetables, milk, or other articles intended to be used for food, found by an inspector in any establishment, whether in course of preparation or after they have been prepared, to be decomposed, diseased, or in any way unfit for food purposes, shall be confiscated by the inspector and destroyed under his supervision.

9. No food or food product shall contain any deleterious drug, dye, or preservative, or other foreign substance injurious to health.

(2) Pending the issue by the Inland Revenue Department of its regulations relating to Food Standards, no drug, dye, preservative, or seasoning which has not been approved in writing by the Veterinary Director General, shall be used in the preparation or packing of any food product.

(3) Proprietors of establishments will be furnished by the Veterinary Director General with a list of approved dyes, drugs and preservatives. Any proprietor of an establishment may also submit to the Veterinary Director General for his approval any dye, drug, preservative, or seasoning which he may desire to use, and in the event of any such preparation being approved, its use shall be permitted.

10. With the object of preventing the use of deleterious substances, inspectors shall, as often as deemed advisable, procure samples of the preservatives used, as also of the different food products during their preparation, or after the same have

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been prepared, and shall submit them without delay to the Veterinary Director General.

The proprietor of any establishment shall, upon request of an inspector, furnish to him free of charge any sample or samples of foods or food products, or of any preservative, seasoning, or other ingredient used in the preparation of foods. Samples so obtained must be sealed, labelled and marked with a description of the same, together with the inspector's name and the date, and forwarded at once to the Veterinary Director General.

11. Containers in which vegetables, milk, or other articles intended for food are finally placed, shall be clean and sanitary, and, if previously used, must be thoroughly sterilized immediately prior to being filled.

12. Containers or packages in which fruits, vegetables, milk, or other articles prepared for food in any establishment are placed shall be marked, unless otherwise ordered by the Governor in Council, with:—

(a) The initials of the Christian names, the full surname, and the address, or, in the case of a firm or corporation, the firm or corporate name and address of the packer, or of the first dealer obtaining it direct from the packer who sells or offers the same for sale. Such dealer shall, upon the request of the inspector appointed under this Act, disclose the name of the packer of such articles;

(b) A true and correct description of the contents of the package.

These requirements shall be embodied upon a trade label, stencil, or lithographed design, which shall be of a size reasonably proportionate to the size of the container or package, having thereon, as provided above, the name and address of the packer or of the first dealer, and a true and correct description of the contents.

13. No container or package shall bear any label or mark of any kind which falsely represents the nature or quantity or weight of its contents, or the date when such contents were packed.

14. No person shall offer for export or shall export any fruits or vegetables, or fruit or vegetable products, canned, bottled, evaporated, dried, or otherwise preserved for food, or any milk, condensed, evaporated, or otherwise preserved for food, in any establishment, unless the requirements of section 12 of these regulations as regards labelling have been complied with in respect to such articles.

APPENDIX No. 17.

OTTAWA, May 1st, 1911.

SIR,—I have the honour to present herewith a series of short articles on Horse Breeding and the Care of Mares and Colts, which I have prepared in the hope that they may be of some value to farmers interested in this particular branch of animal industry.

I would recommend that these should be printed in bulletin form for general distribution.

I have the honour to be, Sir,

Your obedient servant,

J. G. RUTHERFORD,

*Veterinary Director General and
Live Stock Commissioner.*

To the Honourable
The Minister of Agriculture,
Ottawa.

THE BREEDING OF HORSES.

It is an old and true saying, never truer than it is to-day, that "there is always room at the top"; and this applies, not only to the human race, but to all the various species of domestic animals. Thus while the individual who breeds and raises scrub stock may, and doubtless often does, find considerable difficulty in disposing of his surplus, the man who successfully devotes his attention to the production of a first-class animal is seldom found complaining for want of a customer. While this is true of all kinds of stock, it is for obvious reasons especially the case with regard to the horse; for while the beef from a scrub steer, the mutton from a scrub wether, the pork from a scrub hog, or the butter from a scrub cow, while not so remunerative as similar products from specially adapted animals, will, if of fair quality, generally find a purchaser, the scrub horse is always a drug in the market, and is sure to be less and less demand as time passes and public taste in this respect becomes more fastidious on the other hand, the good horse was never in greater request than he is to-day. All over the civilized world the prices paid for the good horse of any distinct class are on the rise, and the man who has him or can breed him is sure of his market and his money. This being the case—and that it is so, is capable of easy demonstration—it behooves us to do our best to find out how to obtain him.

Every man who owns a mare, ought, before stinting her, to draw a mental picture of the horse he wants to get from her, and in doing so must not, of course, lose sight of the mare herself, nor of the influence which she must, of necessity, wield in bringing his projects to fruition. Her size, shape, make and breeding must all be considered and carefully weighed before the sire of the future prodigy is selected, while he must be chosen with the view of perpetuating the good points and overcoming the deficiencies of the dam. The great initial law of breeding is that of "Heredity", or "like produces like"; and while, as will be shortly shown, there are many and frequent deviations therefrom, capable more or less of being guarded against, this is the sheet-anchor of the breeder, the basis of his calculations, and must be acted upon in all cases, except where some individual idiosyncrasy has been incontestably proved to exist. This principle of "like producing like" is so generally recognized that it is scarcely necessary to dwell upon it, except perhaps, to call attention to the little but

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salient fact, liable in horse breeding to be, by the beginner, overlooked, viz., that like really only produces like from like, or in other words, that in order to obtain a perfect production of the original type, both sire and dam must be of the same type, and also of the same type as to ancestry. In cases where this similarity of type does not exist, however, and where one parent has a preponderance of line breeding, the prepotency thus acquired will stamp the progeny with his or her characteristics in a marked degree. The transmissibility of disease, or of that tendency towards disease known as hereditary diathesis, frequently appears to evade this last clause of the law, as no amount of sound line breeding or individual soundness on one side seems to avail in preventing the perpetuation of congenital faults through the other parent, even when the latter is of very inferior pedigree. Apart from the question of disease, however, it may be accepted as a general rule that the straighter the pedigree of an animal the greater will be the prepotency exhibited in marking the progeny.

In-breeding, though by no means to be commended, was a great factor in the earlier days of scientific breeding in conferring the power of perpetuating a distinct type upon various families of both horses and cattle, although in such cases I have always been of the opinion that it partakes to some extent of the nature of the next phase of our subject with which we have to deal, viz., "Atavism" or "reversion," better known, perhaps, as "breeding back." "Throwing back," the bug-bear of the cross-breeder, has never been fully explained, although the researches and discoveries of Mendel have, of recent years, thrown a flood of light upon the subject. It is undoubtedly due to dominant ancestral influence but without a thorough and complete knowledge of the lineage direct and collateral of both sire and dam, it is, in most cases, practically impossible to account for its occurrence in line bred stock. Many apparent freaks and sports of nature are due to Atavism and it is the strongest possible argument in favour of pure bred sires and dams, as, in the case of such animals, the reversion, when it does occur, is to an ancestor of the same type of, perhaps, as good individual quality as the more immediate progenitor, while in breeding from mongrels the chances are all the other way. In short-pedigreed stock also the tendency to throw back is very much stronger, owing to lack of the prepotency conferred by a long line of ancestors of similar type. This is very clearly shown in breeding to the so-called general purpose and agricultural stallions, many of them remarkably fine individuals, but seldom, even when bred to equally fine mares of similar short breeding, getting colts at all equal in any particular to either the sire or the dam, who doubtless obtained their excellence from one or more crosses with pure-bred stock. The stinting of cross-bred mares to cross-bred sires is, for this reason, the most rapid and effectual mode of deteriorating horse-flesh yet discovered, as the large number of shapeless, unsalable plugs which disgrace this continent amply demonstrates. What intelligent breeder wishing to improve his herd of cattle, would use a grade bull, and yet what better right to public patronage has the grade stallion?

Climate is also responsible for many variations from the law of heredity; although, inasmuch as the change is more gradual and not much noticed in one generation, it does not attract the same attention as the more striking phenomenon of reversion. One finds, nevertheless, in almost every country, that the original or native horse has adapted himself to the conditions, geographical or topographical, peculiar to his surroundings. The Arab, at home in the sandy desert, wiry and spare as the scanty herbage which forms its food; the Icelandic pony, with his rough bone and wool-like fleece; the flint-footed, deer-legged, mountain ponies of Scotland and Wales; the ponderous wide-soled draught horses of the Low Countries; the active mustang of South and Central America, the hardy French-Canadian and the much-enduring Shagginappi are all living proofs of Dame Nature's wonderful power of adapting herself to circumstances.

Variation from the type anticipated is also occasionally brought about in a way but seldom taken into consideration, viz.; through the nervous impression produced on a female at the first service, stamping her subsequent progeny in a greater or less

degree with the characteristics of her first mate. This phenomenon, termed scientifically *Telegony*, is, as most dog-fanciers know, frequently observed in the bitch, being, of course, more noticeable, owing to the remarkable divergence of canine types; but it is also, recent pronouncements to the contrary notwithstanding, patent to the close observer of horses. Frequently, in the Middle States, I have noticed horses which, at a short distance, strongly resembled mules, and, upon inquiry, have invariably found such animals to be the progeny of mares which had first been used in breeding that useful but unpretentious hybrid. Though too generally entirely disregarded, the possible occurrence of this form of variation should be taken into consideration by the careful and ambitious breeder, especially when a pure type is sought to be attained.

Variation may be due to extrinsic causes, as when monstrosities are borne by females injured or frightened during pregnancy, causing violent nervous shock; or in a less marked form by an impression produced upon the imagination of the dam by some unusual sight not necessarily of a frightful or terrifying nature. Most of us have read of the smart trick which Jacob played upon his father-in-law; and in somewhat more recent years Mr. Warfield, the eminent cattle breeder of Kentucky, relates that an Alderney heifer grazing in the same field with a number of army horses, produced a heifer calf with the letters U.S. distinctly marked in white hairs on the left shoulder, which peculiarity was also noticeable in her heifer calf. While variations of this description are interesting, they are not so frequent among the domestic animals as they are in the human species and may therefore be held to scarcely affect practical breeding operations. The two last mentioned variations are, needless to say, much more likely to occur in animals of a highly sensitive, nervous temperament than in those of a more lymphatic and lethargic nature.

Having now briefly mentioned the laws which govern the science of breeding, it may be well to devote a few words to their application. By the careful selection of good individuals of proven prepotency all the varieties of the horse now known as pure breeds have been brought to the present standard of excellence; and by using the standard thus made ready to his hand, I believe it is possible for the modern horseman to breed any kind of horse he may fancy. While I do not propose to advise farmers as to the particular kind they ought to breed, I may here formulate a few brief rules, the observance of which will, I am certain, take no money out of their pockets:—

1. Use only pure-bred sires; or, at least, such as have sufficient line breeding to insure prepotency. In this way an amount of certainty in experiment, so to speak, is obtained, and the danger of reversion to an inferior type is greatly lessened.

2. Do not club your mares, even at greatly reduced rates, to any one horse; but carefully study the good and bad points of each, with the object of stinting her to the horse best adapted to improve her good points and remedy her defects.

3. Watch carefully the horse markets of the world, and study the questions of supply and demand in horse-flesh, so that you may be able, in the near future, to command the highest price for the produce of your labour and skill.

4. Avoid violent crossing. All deformed colts are not caused by mental impressions, very many being due to the foolish but too common practice of stinting small light mares to heavy draught sires. It is well known that some stallions are notorious for this sort of thing; and it is a curious but instructive fact that the worst offender I ever knew was himself a small horse, but bred from extra heavy Clydesdale stock on both sides of the house. While this is, perhaps the most objectionable, all violent crossing will be found, as a rule unsatisfactory.

5. Breed only from sound stock. I cannot impress this maxim too strongly upon you. The Royal Agricultural Society of England, acting upon the advice of the Royal College of Veterinary Surgeons, disqualifies for premiums, horses suffering

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from any of the following diseases: roaring or whistling, ring bone, side bone, navicular disease, curb, bone spavin, bog-spavin, grease, shivering and cataract; and, under certain circumstances, splint, string-halt, contracted feet, weak feet and bursal enlargements, such as throughpin and wind galls. You will be wise, then, to look out for these maladies and to refrain from breeding from animals of either sex afflicted with them, as also from parents of faulty conformation or weakly constitution, there being quite enough unsound and shapeless horses in the country without your deliberately adding to the number.

THE TREATMENT OF MARES IN FOAL.

As the foaling season approaches, owners of pregnant mares are naturally somewhat concerned for their welfare, and as many Canadian farmers have a comparatively limited experience in horse breeding, a few hints as to the proper diet and general treatment of the prospective equine matrons may not come amiss. The mortality among both mares and foals in this country is very much larger than it ought to be, and while in some instances doubtless, loss is unavoidable, in a great majority of cases the death of either dam or progeny is directly traceable to the ignorance, carelessness or cupidity of the owner.

In the first place a great many mares are annually bred which ought not to be put to the horse at all. The farmer who has but one breeding female and who calculates generously to give his mare a week's rest at foaling time, would in most cases find himself in pocket by either keeping her religiously from the stallion, or if unable to resist the temptation, by trading her for a gelding. No mare can be reasonably expected to work hard at all kinds of drudgery from year's end to year's end and at the same time develop, deliver and rear a foal at all likely to prove an ornament to his species or a source of profit to his owner. Mares used in this way are the victims of gross injustice, and such a system of horse breeding can end only in disgust and disappointment. Only such animals should be stinted as can be spared from the rougher and more arduous tasks of the farm both during pregnancy and for some time after foaling. The man who puts a good mare to the horse, rattles her through a stiff harvest, lifts an engine or separator with her several times in the fall, trots her sharply home from the elevator, hauls wood and hay with her all winter over all sorts of roads, her sole respite being in stormy weather when she stands tied up in a none too comfortable stable, on the hardest of hard feed, puts her into spring work and only removes the harness when labor pains make their appearance, is often the first to complain of bad luck because his breeding operations are not a success. The confidence of such men in Providence and in the procreative powers of their long suffering mares is apparently unbounded, for they never seem to profit by experience, failure appearing only to stimulate them to fresh experiments on the same lines. The number of abortions and premature births among mares handled in this unreasoning and unreasonable fashion is enormous, while malformation, malnutrition and malposition of the fetus are frequently induced in this manner. Of five mares which I noticed, some years ago now, one morning in March, tugging and straining over bare roads with big sleigh loads of wood, two aborted, one dropped a dead foal, one had the foal removed piecemeal, while the fifth after considerable difficulty actually succeeded in rearing a creature in some few general characteristics resembling the species to which he belonged.

In sharp contrast to the above-mentioned manner of handling mares is the pampering system, and while slightly preferable it is very far from being correct or advisable. In this case the pregnant mare is kept entirely idle during the winter; she is in foal, therefore she must not only do no work, but she must not leave the stable, lest she catch cold, lest she slip and fall, lest she run about and over exert herself. She is overfed with stimulating food, the system becomes loaded with fat, the muscular tissues

are flaccid, the excretory organs are torpid, the circulation is languid, and when at last the foal sees the light it is puny, weak and undeveloped, more likely to die than to live, while if any trouble or obstacle presents itself during the act of parturition the mare herself is apt to fall a victim to the mistaken kindness of an over indulgent owner. Many mares also are treated in this fashion all winter, and with the system weakened throughout by lack of proper exercise and other means mentioned above, are turned into hard exhausting work on the advent of spring, in some cases when they are within a few weeks of foaling.

There is, however, a medium course, by which a great deal of useful work can be obtained from a brood mare, not only without injury, but with positive benefit to both the dam and progeny. Steady—mark the word—not too heavy employment, is even better for a pregnant mare than total idleness, but especially during the last half of pregnancy, it ought to be one thing or the other, either the collar should be taken off and kept off for good or it should be worn more or less every decent day throughout the winter. The far too frequent custom of allowing mares to stand idle on full feed for periods varying from one week to four, and then suddenly starting them off to the distant haystack or wood lot, perhaps ploughing through snow up to the belly or straining across bare spots with a big load behind them, can not be too strongly condemned. Such treatment is hard enough on any horse, but when meted out to heavy brood mares it is cruelty to animals in the first degree. It is little wonder that so many foals are annually quietly interred in barn-yard manure heaps, and that so many mares prove “not in foal” when the expectant stallion owner puts in an appearance to claim his reward.

Every man who wishes to raise foals successfully ought to have a yard, well sheltered by straw if nothing else, in which his mares when otherwise idle may exercise themselves for several hours a day, thus keeping the muscles developed and the vital organs in full and healthy play, so that when called upon, should necessity arise, to do a little work, no shock may be given to the system. A good, roomy, clean and well ventilated loose-box should also be provided for each matron, so that perfect rest may be nightly obtained, and in case of abortion from any cause the isolation thus secured may be the means of preventing similar misfortune to some other member of the stud. When brood mares are worked they should be driven only by reliable and trustworthy men; over exertion, sharp backing or rough handling of any kind should be unknown, the single-trees should be longer than those in ordinary use, deep snow or other bad footing should be sedulously avoided, riding forbidden, and whip entirely banished from the neighbourhood.

The diet should be generous but judicious; if too dry and stimulating it may cause constipation, with torpidity of the liver and other organs, seriously affecting the development of the fetus, while if too relaxing it will produce a looseness and flaccidity of the whole system, and a general lack of vigour with a tendency to abortion on the slightest provocation. Coarse, bulky, indigestible foods should be avoided, as also any sour, musty, frozen or fermented articles of diet, while all sudden changes are to be condemned. Bran may be given with freedom, but flax seed, oil meal or oil cake, ought to be used with great caution, and only when a decided tendency to constipation is known to exist. A liberal supply of good hay, a little oats and bran twice a day, with soft feed at night, and a regular allowance of salt is fair feeding for any mare, but common sense must be employed and the system regulated by a gradual and judicious adjustment of the component parts of the diet. Ice-cold water occasionally induces abortion, and when possible the chill should therefore be taken off. All surgical operations are attended with danger, and medicine should be entirely tabooed, save in case of vital emergency—physic especially, having a tendency to relax the womb as well as the bowels, ought to be given only when absolutely necessary. Young mares should be often gently handled all over and accustomed to having the

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udder and flanks touched, this simple precaution frequently obviating a great deal of subsequent trouble and annoyance. As the time approaches for the mare to foal she ought to be closely watched, so that should assistance—not mischievous interference—be required it may be furnished without loss of time.

With regard to the symptoms of approaching parturition, no rule can be laid down, as many mares will loosen up, make bag, form wax and even run milk weeks before they foal, while others will do none of these things, but simply lie down and institute proceedings without any warning whatever. As a general thing, however, when the teats are full and the piece of wax on the end is succeeded by a drop of milk, when the hips have sunk and the vulva has relaxed, while the animal shows symptoms of more or less uneasiness, the act of foaling is not far off. The treatment to be afforded to the foal and to its dam after the act of parturition has been accomplished may conveniently be considered in another chapter.

THE CARE OF YOUNG FOALS.

It is well known among breeders that it is very difficult to catch a mare in the act of parturition, and that if the foetus is in proper position, and everything else favourable, birth occurs very quickly and easily. Should you, however, happen to be on hand when your mare foals, and the youngster is coming right, but not progressing as fast as he might, it will do no harm to rupture the membranes and help a little, pulling only when the mare presses, and always in a downward direction or towards the hind feet of the dam. It would appear on first impression that the breath is a necessary and indispensable adjunct to life; but in the unborn foal such is, of course, not the case—the first inspiration is taken upon the advent to the open air, of the little animal, and it is of importance that nothing shall interfere with the supply of oxygen to the lungs as they begin to assume their vital functions. Many foals are lost through the nasal passages being occluded by the fetal membranes or otherwise, the first feeble attempts of respiration proving of no avail, the blood fails to become oxygenated, the next effort is weaker still, the heart's action, at the best uncertain owing to the sudden change in the course of the circulation, soon ceases entirely, and independent existence ends before fairly begun.

As soon as the foal has emerged, free the head from the envelopes, see that the air passages are clear of mucous or other fluid, and lay the animal on his right side. If the umbilical cord or naval string is not ruptured at birth, it may be tied with a stout cord a couple of inches from the navel and cut below the ligature, and to prevent blood poisoning, or the absorption of septic germs, it may be dressed with a strong solution of carbolic acid, care being taken not to injure the surrounding tissues, or it may be temporarily smeared with carbolic oil. Should animation appear to be suspended while the heart still beats, an attempt may be made to resuscitate the little creature by pouring cold water in small quantities on the head, slapping the body with a cold wet cloth, holding ammonia to the nostrils or even by what is generally more convenient, puffing a little tobacco smoke into them. Should these measures fail, a little blood may be taken from the navel, but when syncope is present there is no great hope of bringing about recovery.

I would like here to interpolate a little advice regarding foals "coming wrong." If there is any malposition of the foetus not of a serious nature, you may, if you are at hand, be able to rectify it, using judgment and common sense, bearing in mind that a mare will not stand much rough handling, and, above all, keeping cool and endeavouring to avoid excitement, which at such times is very natural and very dangerous. Should you find yourself unable to remedy the evil, lose no time, but send at once for professional assistance if such can be procured, and, meanwhile,

allow no interference save by some intelligent and thoroughly experienced stockman who understands the vital importance of absolute cleanliness and who will know, after making an examination, whether he can do any good or not, and will guide himself accordingly. Great harm may result from well meant but mischievous interference with these cases, and the veterinary surgeon often finds on his arrival a well nigh hopeless subject which, if let alone, he might have handled with one tithe of the trouble and with far greater certainty of saving life.

Space will not allow of our entering into the details of the various abnormal presentations to which the equine fœtus is liable, and of the modes of manipulating them to effect delivery, and such is not the object of this article. We will suppose that the foal is dropped safely and lying breathing and sneezing behind his dam, who has just had the gruel with which she ought always to be rewarded after the termination of her labour. The mare will generally, on rising, turn round and begin fondly to nose and lick her progeny, a process, by the way, of great importance and value to the latter; but young and nervous mares, especially if delivery has been protracted and painful, will often act in an entirely different manner, snorting, pawing and evincing fear and irritation at sight of their offspring. Under such circumstances it is well to protect the foal for a time by a small hurdle or gate placed across one corner of the roomy, airy, dry and warm loose-box, in which, it is presumed, he has first seen the light, to rub him smartly but gently with soft rough towels and to endeavour to induce the mare to begin the licking process by sprinkling the youngster with a little dry bran or meal and salt. Such measures are not, however, often necessary, kind considerate treatment and judicious letting alone generally proving effectual in bringing about a reconciliation in the family.

Plenty of dry, clean bedding should be furnished, the shorter the better, for the foal will soon begin to tumble about in repeated attempts to get his long and shaky legs under him. If he does not succeed after a reasonable time in getting on his pins, a little assistance may be given, and his dam proving friendly, he will soon, if let alone, find his way to the maternal font; but if he is unable to stand, or the mare is touchy and restive, she ought to be held while he is guided to the teat and allowed to obtain nourishment. If the foal is weak and quite incapable of supporting himself, the mare may be milked and the fluid thus obtained given to him slowly and very carefully, it being a matter of great importance that the little chap obtain if possible some of the very first milk secreted by the mare. When once friendly and confidential relations have been established between mare and foal, they should be left alone for some time, care, however, being taken to remove the placental membranes from the stall as soon as they are dropped.

If the mare has gone much over her time and especially if she has lost much milk, it will be necessary to watch the foal closely for symptoms of constipation, which will be manifested in the first place by continued elevation of the tail accompanied by straining without the passage of feces. This will be succeeded by dulness and then by evidence of pain, the abdomen will become bloated, the little animal will show great uneasiness and begin to perspire and the pulse and respiration will be accelerated. In the early stages a few ounces of soapy warm water or a little raw linseed oil introduced by a syringe into the rectum will generally afford relief, but should acute pain and distress make their appearance, the administration of two or three ounces of castor oil with twenty or thirty drops of laudanum and half a teaspoonful of turpentine well shaken up, will be in order; a small enema should also be given from time to time, and the abdomen covered with a woollen cloth wrung out of hot water. These measures if adopted in time will usually be sufficient and it must not be forgotten that the administration of medicine to newly born foals is fraught with great danger so that the mechanical remedies, viz., the injections and the stupes to the abdomen are much preferable to large or repeated doses of physic.

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Diarrhœa may set in, either spontaneously from septic causes or as a result of the free use of medicinal agents, the mortality among young foals from this affection being very great. The treatment will depend on the origin of the trouble—if from medicine little can be done save in keeping the strength supported by stimulants and concentrated nourishment, and for this purpose an egg beaten up with a teaspoonful of brandy and a few ounces of milk from the mare will be found very effective—this mixture may be repeated from time to time as the condition of the patient may demand. Should the diarrhœa on the other hand, appear to originate spontaneously, it is possibly due to irritation of the bowels, and in such cases no treatment is more successful than the exhibition of one or two table-spoonful of castor oil with a little laudanum to allay any tendency towards griping. No relief being afforded by these measures it is advisable to try an antacid, and for this purpose a table-spoonful of lime water may be given in two or three ounces of milk from the mare every three or four hours, while the strength of the patient is to be sustained by stimulants and nourishment as recommended above.

Where veterinary assistance is not available, five to fifteen grains of grey powder given twice a day will often be found beneficial.

In severe and protracted cases of septic origin formalin has been successfully used. This agent must, however, be used with caution, the best mode of administration being as follows: Dissolve one fluid ounce of commercial formalin in 10 ounces of water and give of this solution a teaspoonful or a teaspoonful and a half, according to the size of the colt, in one pint of milk, twice or at most three times a day.

Small injections of flour gruel or very thin starch containing a little laudanum are also useful.

The greatest attention should be paid to the sanitary conditions; the stable as well as the patient and the dam should be kept scrupulously clean while the diet of the latter should be closely watched and changed gradually from time to time. The facts that animals on pasture are seldom affected and that the malady once established in a stable, appears to recur regularly, are strong arguments in favour of the adoption of all possible hygienic precautions.

Another and perhaps the most fatal disease to which young foals are liable is suppurative inflammation of the navel and joints often erroneously termed inflammatory rheumatism. The first symptom of this malady is a difficulty of motion, accompanied by a swelling in the region of the navel or in one or more of the joints, the swelling rapidly increasing in size and terminating in large abscesses containing enormous quantities of unhealthy pus. The progress of the disease is characterized by high fever, rapid emaciation and great weakness followed by stupor, fetid diarrhœa, general marasmus and death. Curative treatment does not appear to be of much avail: the opening of the navel if inflamed should be frequently dressed with carbolic lotion, or other suitable antiseptic, a mild anodyne liniment applied to the swellings, the bowels gently moved by a small dose of oil and the strength sustained by concentrated nourishment and the judicious use of stimulants, while the abscesses when ripe are to be freely opened and the cavities injected with an antiseptic solution. The disease is septic and an ounce of prevention is worth a pound of cure. It is almost invariably due to the absorption of germs (*streptococci*) by the exposed end of the umbilical cord or navel thus affording good reason for the treatment of that part recommended above. With a view to the prevention of this disease also, the most scrupulous cleanliness should be observed in the housing of young foals and their dams; the all too common custom of letting them lie on a couple of feet of heating manure thinly covered with straw, or on a cold wet earthen floor, cannot be too strongly condemned. The floor and bedding should always be dry and clean

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while an occasional sprinkling of lime will not cost much and will add greatly to the healthfulness of the inmates.

Where the existence of infection is suspected the floors and stalls should be thoroughly scrubbed with boiling water and subsequently treated with a reliable disinfectant such as crude carbolic, creolin, or a solution of corrosive sublimate of a strength of one part to 1000 parts of water.

Occasionally the urine continues to dribble from the naval opening owing to the duct from the bladder having failed to close after birth. In such cases the parts should be thoroughly cleansed and rendered aseptic after which a subcutaneous ligature is to be applied but this like all other operations requiring surgical skill, and in fact all really serious or acute conditions should, when possible, be relegated to the qualified veterinarian.

There are of course numerous other ailments and accidents to which young foals are liable, but those mentioned are responsible for the needless loss of many valuable animals and should, therefore, be carefully guarded against and promptly but cautiously dealt with on the first indication of trouble.

THE CARE OF WEANLINGS.

To some, advice on this head is, of course, superfluous, but others, less experienced, may be glad of a few hints as to the most approved methods of starting the youngster on an independent career. In the first place, be certain that your foal is old enough to wean, that he is in fair condition, thriving and healthy, that he knows what grain is and what it is for, and that, should you have any cow's milk to spare, he will not be above drinking it. As to age, no colt should, if at all possible, be permanently separated from his dam until he is at least four months old, while another month, or even two, by her side will make him a better horse and lessen considerably the risks of his first winter. Many farmers, however, who are trying to raise colts can ill afford to let their mares suckle so long, and while it might, in many cases, be more profitable for such men to refrain from breeding altogether, the fact remains that they must use the mares on the farm, and the foals have to suffer accordingly.

It is a good plan to teach the foal to eat out of the same box as his dam, and it is astonishing how little tuition, even with very young colts, is necessary when the food is placed within easy reach. For some time also before the foal is actually weaned he should be schooled to drink milk, if there is milk to be had, and it is well to remember in this connection that milk drinking is an accomplishment of no little value for any horse to acquire, nothing being more advantageous to an animal suffering from any febrile or debilitating disease, than the voluntary absorption of milk in lieu of other fluid when the appetite for solids is capricious or altogether lost. As regards the diet best suited for young foals, many different opinions are promulgated, but in the experience of the writer nothing is equal to good sound oats with a moderate mixture of bran twice a day, and a well scalded, not too bulky, mash of the same materials, seasoned with a tablespoonful of salt, and perhaps a handful of crushed oil cake for the evening meal. Many recommend crushed oats, but repeated trials have convinced the most successful breeders that whole oats are more nutritious, and if properly masticated, as they generally are when fed with dry bran, more easily digested than chopped feed of any kind.

Colts should be halter broken and taught to lead when yet with the dam, as this renders them much more tractable and easily controlled during the excitement inseparable from weaning, and also facilitates housing when the accommodation is limited, and there are several to be kept together. Loose-boxes are preferable to ordinary stalls for young stock, but provided the stable is clean, airy and well lighted it will do no harm to have them tied at night, taking it for granted that they enjoy for the

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greater part of every day the freedom of a roomy, and in winter, well sheltered yard. This latter point is of very great importance. Your youngster must have a chance to develop bone and muscle, and in no other way than by lots of exercise can he be reasonably expected to properly assimilate the generous diet recommended above, while despite all old-fashioned ideas to the contrary, without a liberal grain allowance he will not likely be much to look at when the sun begins to melt the snow in the spring. When two or more colts are kept together it is better to have them separated at feeding times, or the strongest of the lot will be apt to wax fat at the expense of his weaker or less voracious companions, many backward colts being literally starved by careless neglect of this simple precautionary measure.

Weanlings are frequently troubled to a considerable extent with intestinal worms of various kinds, especially if grazed on low lying pastures in late summer or early fall. Some of these parasites are more to be dreaded than others, but none of them are desirable guests or in any way beneficial to their involuntary hosts, and it is, therefore, advisable to take measures for their removal. The old farmer's remedy of wood ashes and salt is not to be laughed at in this connection, and if persevered with in small doses for some time will often have the desired effect, but where a more speedy and certain riddance is desired it is well to give a course of anthelmintic powders, as iron sulphate 1 drachm or powdered areca nut 2 or 3 drachms twice a day in a little soft food for a week, to be followed by a drench composed of turpentine 1 oz., and raw linseed oil from 10 oz. to a pint, according to the size and condition of the patient. This mixture should be given on an empty stomach and all dry food withheld until the bowels have responded to its action. In all cases of intestinal worms, benefit is found from occasional injections of tepid water strongly impregnated with soap, and for this purpose Gamgee's enema funnel, a cheap and convenient instrument easily turned out by any tinsmith, will be found suitable. Some varieties of worms demand for their successful removal a repetition of the medicinal treatment; but those most commonly met are generally satisfactorily disposed of at the first attempt.

External parasites should also be guarded against. Many a good colt has gone to skin and bone from the constant irritation and uneasiness produced by lice, and whenever a young animal shows unaccountable loss of condition and want of thrift it is advisable to examine him closely for signs of the presence of these undesirable companions. Should they be detected, the sufferer may in reasonably mild weather be washed well with carbolic soap and soft warm water, and after thoroughly drying the skin, carefully and closely dressed, more particularly about the roots of the mane, with a good insecticide. For this purpose an ointment composed of equal parts by weight of sulphur and lard will be found effectual, as also safe, cheap and easily procured. In cold weather the washing must of course be dispensed with, but the ointment may be applied without risk in a moderately warm stable at any season of the year.

When colts are debarred from taking much outdoor exercise their hoofs very soon become deformed, and great harm is often done to the bony and tendonous structures of the limbs from neglect to properly trim and regulate the growth of the horny coverings of the feet. Accidents of various kinds are liable to occur, and in all cases the advantage of having the patients halter-broken, thoroughly domesticated and free from fear of their human friends is incalculable. This state of affairs can only be brought about by the most careful, systematic and painstaking handling of the young animals from the time they are foaled, but more especially during the first week or two after weaning.

APPENDIX No. 18.

OTTAWA, June 28, 1911.

The Honourable,
The Minister of Agriculture,
Ottawa, Ont.

SIR,—I have the honour to present herewith a paper by Mr. H. S. Arkell, B.S.A., Assistant Live Stock Commissioner, entitled 'Observations upon Government Assistance to Agriculture in Certain Countries of Europe.'

This paper contains much useful and valuable information regarding the methods followed by various European Departments of Agriculture in effecting the dissemination of useful knowledge and otherwise assisting in the development of the agricultural resources of their respective countries. I am satisfied that it will be read with interest and profit by many Canadian farmers and would, therefore, recommend that it be published for distribution as Bulletin No. 15 of the Live Stock Branch.

I have the honour to be, sir,

Your obedient servant,

J. G. RUTHERFORD,
Veterinary Director General and Live Stock Commissioner.

OBSERVATIONS UPON GOVERNMENT ASSISTANCE TO AGRICULTURE
IN CERTAIN COUNTRIES OF EUROPE.

The observations upon the particular assistance rendered to agriculture and agricultural industries by the governments of certain countries in Europe, as contained in this report, are based upon notes made by the author while on a visit to Great Britain, France and Belgium during the summer of 1909. It had been the original intention, in planning this visit, to confine the account to an inquiry into the nature of the work undertaken in connection with horse breeding, but the organization of the Department of Agriculture in Ireland seemed to offer such valuable suggestions, that a brief outline is included of the operation of measures in use by it for the encouragement and development of general agriculture in that country. As originally presented these notes were issued in the form of a report to the then Minister of Agriculture of the province of Quebec, with whose assistance they were obtained and prepared. They have now been partially rewritten and revised in so far as seemed necessary, in order to extend their suggestion and application to the wider field of the agriculture of Canada.

Ireland's need, agriculturally, had been seriously recognized for many years, and it will be remembered that a Royal Commission took evidence, in 1907, upon the nature of congestion in the rural districts. The memoranda, compiled by this commission, established very pointedly that lack of information and lack of organization had been two features of very great importance in retarding progress and in continuing conditions which had maintained poverty upon the land. Previous to 1899, the efforts of the Royal Dublin Society had been directed strongly toward the improvement of conditions amongst the farming population, but, in part, the somewhat local nature of its

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organization prevented its work from having the wide significance that was necessary and in the end found desirable. It paved the way, however, for a more comprehensive policy and in 1899 an Act was passed creating a Department of Agriculture and Technical Instruction for Ireland, whose business it has been to administer a rather large amount of money and machinery in the interests of Irish agriculture.

For convenience sake, the work undertaken by this body may be considered under three heads:—

1. Agricultural instruction.
2. Improvement of live stock.
3. Special investigations.

Professor Campbell states in his evidence before the Royal Commission that after the organization of the Department, the first duty of the staff was to attend meetings of county councils for the purpose of explaining to them the provisions of the Act and to receive and consider suggestions as to what the Department should do for agricultural development. During these visits advantage was taken of studying the peculiarities of Irish agriculture with a view to meeting the particular need of the various counties in a more intelligent way. The conclusions arrived at were to the effect:—

1. That the most important work which the Department had to perform was that of laying the foundation of a system of agricultural education.
2. That the application of the Department's energies might be effectively directed, in the interests of the farming community, toward the improvement of live stock.
3. That further projects of a more specific nature in the way of special investigations might wisely be undertaken because of their value for demonstration and experimentation.

It is proposed to give a brief outline of what methods have been pursued in these three directions and, as far as possible, an appreciation of the value of the work to the country.

AGRICULTURAL EDUCATION.

The general scheme evolved was framed in such a manner that it might adapt itself to the peculiar conditions of the country. The scheme provides in the first place for a system, in each county, of 'itinerant instruction' in agriculture, horticulture, dairying and poultry-keeping, such that a fund of information and a source of advice may be readily accessible to farmers and their sons who, in many cases, have few other means of acquiring it. This method of instruction was followed in subsequent years by winter schools of agriculture, held at various centres in the counties, where a little more systematic training was made possible, but which could still be obtained at small expense.

Upon the work of this itinerant instruction is based the permanent institution of the agricultural schools and colleges. At three stations in the country young men are taken in as apprentices for one year and receive practical and technical training in agriculture for a moderate fee. More stations would have been established had teachers been available, but there has been a lack of these from the start.

This station work, in turn, leads up to that of the central institution for the country, the Albert Agricultural College at Glasnevin which is in affiliation with the Royal College of Science in Dublin. At this college is provided the highest form of technical education for the training of men who are to become teachers and specialists in agriculture.

A conception of the nature and policy of the work undertaken in connection with education can be gathered from the above summary of the methods employed, as well as an idea of the purpose that suggested the framework of the whole institution. The details of the attendance in the various branches will indicate what has

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been accomplished. In 1907-8, there were enrolled in the agricultural course at the Royal College of Science, 26 students; at the Albert Agricultural College, 73 students; in the three schools at Athenry, Ballyhaise and Clonakilty, 66 students, and at the winter classes in the counties, of which there were 33, 529 students. Most of the courses in these winter classes were from fifteen to twenty weeks duration.

As a supplement to the regularly organized system of education, as outlined above 1,453 lectures were given by itinerant instructors, of whom there were 34, at which 81,276 persons were present. Much other work of like nature in connection with dairying, poultry raising, plot demonstration, spraying, bee keeping and butter making, was also undertaken, but of which the details may be omitted. The greater part of this general work is placed in charge of the itinerant and private instructors and their efforts are affecting noticeable improvement in the methods employed by the farmers. The co-operation of the county councils in relation to this itinerant instruction is obtained by placing a large share of its direction under their control. The final responsibility, however, works back naturally to the central authority, and a comprehensive system is thus constituted by which the organized effort may be rendered most acceptable and efficient according to the needs and opportunities of the various districts.

The following statements may serve to reveal the gradual but satisfactory growth in popularity of the general scheme. In 1902-3, there were but two winter classes organized with an enrolment of 44 pupils. In 1903-4, the pupils numbered 161; in 1904-5, 317; in 1905-6, 422; in 1906-7, 449; and in 1908-9, 529. Such an expansion is particularly suggestive as indicating the degree in which these classes have grown in popular favour. Another instance of the same general fact may be given. In 1900-1, there were but three itinerant instructors at work, one in each of three counties, while in 1907-8, there were 34, and these were distributed through practically all the counties of Ireland.

For an estimate of the actual monetary value of this work, the following table giving the export value of eggs and butter will be suggestive.

	1904.	1907.
Butter exported.	£3,793,391	£4,008,220
Eggs exported.	£2,257,362	£2,920,539

It is estimated that the annual increase in the value of eggs exported pays of itself the cost, to the country, of the Department of Agriculture. Much encouragement has been given through the facts noted, to those who have been engaged in agricultural education in Ireland, and particularly to those upon whose shoulders has fallen the major share of its direction and control.

IMPROVEMENT OF LIVE STOCK.

Apparently the most popular of all the undertakings of the Department has been that which has had to do with the improvement of live stock. The energies of the Royal Dublin Society had been in earlier years more particularly engaged in this direction. The Irish farmer's income is derived mainly from live stock and, after the passage of the Act, the interests of those engaged in the industry were early placed before the Department for its consideration. Whatever has been attempted has been undertaken in co-operation with the local county committees upon whom in fact has fallen much of the management and supervision of the details of the various schemes. It may be stated here that the Act empowered the county councils to impose a rate equal to one penny in the pound, on the taxable value of rural districts, comprised within the county, for the purposes of agriculture and such other rural industries upon which they were authorized to expend money. In the majority

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of instances in the case of counties that were able to afford it, the initiative and assistance of the Department depended upon the action of the counties in assessing themselves for the purposes of the schemes in question. The fact that every county in Ireland now voluntarily so assesses itself to make good its share of the expenditure connected with the undertaking, is perhaps the best guarantee of the need and utility of the whole enterprise.

In connection with the live stock improvement scheme there are three lines of work involved, that with horses, that with cattle, and that with swine. For convenience sake, the horse-breeding scheme may be treated of at this point in conjunction with the other two, though at the risk of breaking the account when the methods employed in horse-breeding in other countries are dealt with.

HORSE-BREEDING.

It may be here noted that Irish saddle horses have been for many years accorded rather a fine reputation on the English markets and that they have chiefly gained favour as hunters and for chargers and remounts in the British army. The lines of effort followed by the Department have been mainly to conserve this type and to promote the breeding of this class of horse more generally throughout the country. It was found that the introduction of draught blood into Ireland was playing havoc with the breeding of saddle horses and the use of draught sires is now confined to certain counties only and even to limited areas in these counties. The first business of the Department was to invite applications from owners of high class stallions to have their animals inspected for suitability and soundness, which inspection became the basis for enrolment into its register and for a subsequent subsidy. The standard of recognition and entry into the register was placed on a high level at the beginning and more than one-third of the horses presented were rejected as being unsuitable for use as sires. Much disappointment was caused by this seemingly stringent regulation, but it is now realized that it has been of direct advantage to the country, since it has led to the importation of a large number of good sound sires and as Professor Campbell says: 'a larger number of worthless animals which would otherwise have been imported have been excluded.'

The Department advertises in September of each year that it is prepared to open a register. The applications are received in October and November for such stallions as have already stood at stud in Ireland. Applications for other stallions must be forwarded in September. After the applications have been received, an officer is sent to the country to inspect the stallions entered. His examination is in respect to appearance and soundness. In addition to this inspection, there are other regulations required to entitle the stallion to entry in the register and no stallion not in the register can receive a subsidy. Stallions which are approved are accepted for particular districts only and may not without the written consent of the Department be removed to other districts. In 1908, there were 296 stallions on the register, while in 1901, there were but 128. The increase has been due largely to the desire of farmers not only to have their horses receive the official recognition of the Department, but that as well, through this recognition, they may obtain assurance of increased patronage from the farmers and breeders. It may be added that in the event of there not being a sufficient number of registered stallions in any county for breeding purposes, the Department has, through a well-controlled system of loans, enabled individuals and societies to purchase approved stallions on easy terms.

In making such a loan, it is a matter of first importance that the interest of the community be well served. There is also a proviso attached that the total amount of the loan shall be paid in regular annual instalments in five year's time, during which time or until the loan be paid the stallion remains in substance the property of the Department.

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Another feature of the horse-breeding scheme which parallels the registration of stallions is the selection or nomination of mares, a feature which helps to induce farmers to retain their best mares for breeding purposes. In the spring, exhibitions of mares are held in the counties where a limited number of the largest and best are selected, to the owners of which nomination tickets are issued entitling each to select any registered stallion to mate with his mare. This ticket is given to the stallion owner at time of service in lieu of fee, and he in turn, upon presentation of the ticket, collects his money from the Department. The ticket has a value of from £2 to £3, and if the service fee exceeds that amount the difference must be paid by the owner of the mare. In 1907-8, there were in all 11,036 mares presented at these exhibitions, of which number 5,442 received nominations.

In the popular estimate the subsidy to the mares has been the most effective part of the scheme, but the Director of the work holds very strongly to the opinion that the registration of the stallions has been of greatest value to the country. The utility of the undertaking appears to lie in the stimulus and impetus it gives to systematic breeding, particularly as regards selection and judicious mating and again in the greater degree of uniformity which it promotes and renders possible in the animals that are bred and reared throughout the country. It may be thought to involve too large an expenditure to be continued for any great length of time. It would appear, however, that its service is largely initiatory and educational and that shortly the burden of its continuance may be thrust back upon the communities as they acquire the ability to carry it on themselves.

CATTLE-BREEDING.

The cattle-breeding scheme has been an especially valuable one to the Irish farmers and one in which they have taken great interest. There is a very large trade between Ireland and England in store cattle, which are bred and reared in Ireland and fattened in England and Scotland. A keen demand has always existed for well-bred, early maturing animals and the better class of bulls introduced by the Department into the country has had a decided influence in levelling up the capacity of the cattle to take on flesh. Such was the opinion expressed to the writer by the well-known editor of the *Scottish Farmer* in the course of an enthusiastic comment upon agricultural organization in Ireland. From what could be learned, no scheme has received greater endorsement at the hands of the farmers and none has brought greater financial advantage to the country.

Briefly it consists in this. The Agricultural Committees of the County Councils offer subsidies of £15 each to the owners of high-class bulls, provided that they allow the use of their bulls to farmers at the nominal fee of one shilling per cow. Government inspectors make a selection of bulls in the country as a basis for awarding the premiums and, in addition, personally attend fairs and sales with a view to the purchase of suitable animals for resale on easy terms to individuals or to county organizations. In 1908-9, there were 999 bulls receiving premiums in this way.

Dairy cattle-breeding is also receiving attention in connection with this work though the methods employed are somewhat different from the above. The main virtue of the scheme lies, no doubt, in the generous introduction of new and better blood into the country and, were it not for the poverty of the farmers, the same results could be obtained with a much smaller expenditure of money. It will be remembered, however, that half what is required is met by a tax which the counties lay upon themselves and it seems to be the opinion that no other money expenditure has been more directly successful in carrying increased revenue to the farm.

The assistance given to swine breeding is organized in much the same manner as in the cattle-breeding scheme and the details of it need not be described. The production of pork is a great industry in Ireland, and the attempt is being made to

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develop the country into a larger and more influential competitor for trade in the markets of Great Britain.

In connection with the work of live stock improvement one fact has made itself very evident in Ireland, viz., the scarcity of suitable breeding sires in all classes. Not only has this scarcity been made apparent, but difficulty has been experienced in supplying the need through importation or otherwise. It has been noted that the stimulus and encouragement which has been incidentally given to the breeding of pure bred stock has been one of the most hopeful signs during the development of the work. The scarcity which Ireland feels and has felt will be realized and appreciated by any country as it undertakes progressive work in the same direction and is, it will be admitted, a very certain guarantee of the need of something being attempted. It has been further demonstrated that, with improvement in the lower grades, greater progress is made possible amongst the breeders of the better classes of stock and there is thus a compensating activity in either direction that works toward the mutual advantage of all concerned.

SPECIAL INVESTIGATIONS.

The special investigations undertaken in the various branches of agriculture follow along the channels through which government assistance is very frequently given in this country. They touch in concrete fashion the primary element of production and the people have reaped a direct advantage as the results, through demonstration and illustration, have been placed within their reach. It is worth mentioning that, as the farmers have learned to recognize the value of this direct method of work, they have given the greater support and adherence to the movement in favour of agricultural education.

FIELD EXPERIMENTS.

Irish farmers were badly in need of assistance and advice in connection with the management of the soil and in the growing of crops. Ignorance of the principles of cultivation, drainage, manuring and seed selection had resulted in wasteful practices and in the incapacity of the farmers to obtain a reasonable and normal return from the land. Consequently much attention has been given to the study of manures and manuring. The results of the experiments in this connection have been embodied in leaflets and distributed over the country and have been drawn upon to furnish the substance of many lectures that have been given by the itinerant instructors.

The Department has viewed with satisfaction the better judgment exercised in the application of manures since its work began and in their increasing use. It believes further that this work alone fully compensates it for what has been spent as a whole on county agricultural instruction. The experiments have covered the principal crops of the farm, viz., oats, potatoes, mangels, turnips and hay.

In connection also with the field experiments, variety tests have been conducted with grains and potatoes. Barley and wheat have received chief attention in these tests because of the value of the one for malting and of the other for milling purposes. Very definite results were obtained in the tests with barley, one variety surpassing all others in suitability for use in Ireland. The potato-growing industry is being extended through the experiments of the Department and the supply of marketable produce is being developed.

Much assistance has been given to the business of flax growing through technical instruction and through experiments with manures and seed. The interests of the tobacco-grower have been considered and the forestry problem has been undertaken in a systematic way, in the attention given to both public and private interests.

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In the peat industry, in seed testing and potato spraying, the government's activity has also been exercised and with advantage to the country. In the case of the peat industry, the Department rented an Irish bog, erected peat fuel machinery and demonstrated the process of most successful manufacture. The actual object lesson amongst the people themselves has been found almost the most effective method of stimulating interest and improvement in the work in which the Department has engaged.

In the matter of fruit and vegetable growing, a horticultural expert has been at work in making a survey and in estimating the capabilities of the country in this regard, particularly in the non-fruit-growing districts. His investigations have extended to giving instruction in the growing, harvesting and marketing of fruit. A profitable outlet for the produce has been made possible, through the extension and in some cases revival of commercial jam-making, fruit-preserving and cider-making.

The poultry industry has been developed through somewhat the same system as has been utilized in connection with the other branches of live stock. Eggs and high class breeding stock have been distributed at moderate prices from central farms, instruction has been offered, the fattening process has been effectually demonstrated and assistance has been given in marketing produce.

Two other industries have received attention, cheese-making and butter-making. The first is not of large importance since it cannot be successfully worked conjointly with the raising of store cattle, but encouragement has been given to it where its development was deemed most advisable. Butter-making, however, has long been an important industry of the country, though the methods employed were not of the best, and the product lacked in uniformity and much of it in quality. The Department has turned its attention to the encouragement and development of the creamery system, through the inspection and supervision of creameries, through special courses of instruction for creamery managers and through butter-making competitions. Home dairying has also had its share of attention. The utility of the whole scheme has been spoken of elsewhere.

The important phases have now been covered of the work of the Department in Ireland. From the somewhat general résumé an idea may be obtained of the nature and sphere of its operation, but it is impossible to give an adequate impression of the spirit and motive which underlie it all. The farming population of Ireland has been poor and in some districts the people have suffered from their poverty, particularly as compared with the comforts of civilization which are now believed to be almost indispensable. The barrier of indifference and want of knowledge had made progress an almost impossible and unknown thing. The expenditure of human energy had been wasteful in a high degree and the resources of the country and its people had remained undeveloped and in a large sense unproductive. Ireland's future was menaced through her failure to move forward and in her inability to meet the competition of neighbours and rivals in markets where she had been accustomed to find an outlet for her produce. No one thing has had such an immense and controlling influence on the outlook and possibility of development which it has effected as has the formation and organization of the Department of Agriculture and Technical Instruction. The work undertaken in the interests of agriculture has been especially considered in this inquiry but the Department has engaged itself also in the teaching of domestic science which has opened up possibilities in the home to parallel those upon the land, and in providing facilities for technical instruction which is meeting the claims of technical industries and of those engaged in them, with the same intent and in like degree. The undertaking has been a public spirited enterprise with a large field of labour, and it has borne fruit not only in improving the commercial prospects in the agricultural industries but in stimulating and encouraging the people in educational and social improvement.

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The farmers and their families are learning how to do things and the finger of organized intelligence and energy is leaving its impression, upon every phase of operative endeavour in the country. Methods are being improved, production cheapened, markets strengthened and, though such work must necessarily move slowly, substantial progress is being made. Exports are increasing and improving in quality particularly those of potatoes, butter, poultry and eggs, cattle, pork and horticultural products. The general acceptance of and participation in the scheme by every county of Ireland substantiates its popularity and utility. The largest argument in its favour lies in the fact that steps have been taken to make the work permanent. It began with demonstration to catch the eye and stimulate endeavour and is developing, through education, to the teaching of principles and the training of faculties of observation and judgment. Ireland may very well be destined to become an important competitor against countries of established reputations in the great produce markets of Great Britain. If so, she will be another example of what has been and is being successfully accomplished in like manner in Siberia, Denmark, Holland and in lesser degree in other European countries.

HORSE-BREEDING IN FRANCE.

Since much space has been taken in a description of the general field of work in Ireland, the résumé of the methods adopted by other countries in the assistance given to horse-breeding must necessarily be short. Those in France are particularly interesting from the fact that organized effort in this direction has been in progress since the 17th century. In that century, the Government established a stable of stallions at Le Pin, which it has since maintained and from the time of Napoleon it has had almost complete control of the breeding of horses for cavalry purposes. At the outset it may be noted that the policy of the Department has been dominated in a very large sense by the definite purpose of producing and breeding suitable horses for the army. Most of the horses concerned in this policy are owned outright by the Government. The total number of Government-owned stallions in 1907 consisted of 559 thoroughbred, 2,218 French coach (*) and 574 draught, in all 3,351. It will be seen that the great majority of these horses are thoroughbreds and French coach, and are in fact sires of most suitable blood and breeding for the production of army horses. The best animals in the country are selected for this purpose and many high-class English thoroughbreds are imported, together with a few hackneys.

These stallions were, in 1907, distributed over 947 breeding stations and served 150,934 mares. The service fee in all cases is low, varying from 20 to 100 francs or from \$4 to \$20 in our money. The farmers, therefore, have the opportunity of having their mares served by carefully selected and high-class stallions at moderate rates. The applications for the service of these are determined by lot. Premiums are occasionally given to thoroughbred mares that they may be reserved especially for breeding purposes. The system of selecting and subsidizing mares was at one time resorted to, but, after a trial, has been largely abandoned. Through the donation of prizes at exhibitions, at race meetings and in various other ways, encouragement is further given to the breeding of horses for this purpose.

In this connection it may be stated that a Government school has been established at Le Pin for the training of men who have to do with the selection, inspection and purchase of horses for the Government. By this means a wonderful uniformity has been obtained in the types approved and bred. The training and equipment of special officers as afforded by the Government school has promoted greater efficiency in the public service and has secured a gratifying degree of permanency for the policy of the Department. The whole system has been admirably adapted to the purpose for which it was intended and has given horse-breeding an impetus and a direction of which the country may well be proud. Under ordinary circumstances, however, and

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under conditions such as we have in Canada, the method of work involves too large an expenditure of money. A part of the system, nevertheless, not yet described, is worthy of consideration and contains features which, in a modified form, might well be adopted elsewhere.

Reference is to the methods more particularly in vogue in connection with the breeding of draught horses. France has five practically distinct draught breeds, each confined to a particular district of the country. Of these, the Percheron, bred in the district of Perche, is perhaps the most important. From what could be learned the large majority of the mares in this district are registered. They are owned by small farmers who keep usually two or three of each and who almost invariably raise at least one or two colts during the year. At weaning time, these colts are practically all sold to the large stallion owners, who grow them until they are a year and a half old. They then either sell them or put them to work until they are of serviceable age. The young horses as they develop are carefully fed and trained and, at four years, a stallion is well grown in body, kind in harness and well mannered. That he has earned his own living for the last two years has detracted nothing from his value and, it may be, has given to the bone, nerve and muscles of his system a strength and endurance that will prove an asset to him for the rest of his life.

The Government concerns itself chiefly, in connection with the assistance which it renders to the horse-breeding industry, with the stallions retained for breeding purposes. In France, all horses that stand for service must pass an examination as to soundness before Government inspectors and must be officially accepted, after which they receive the mark of a star upon their neck. The rejected ones are branded with an R and may not be used for breeding purposes. Stallions deemed especially worthy are termed 'approved' and receive subsidies ranging from 300 to 600 francs. These, in 1907, numbered 1,603, and served 82,736 mares. Other stallions accepted, but not

* Also called 'Anglo-Normans or half-bred.'

deemed of more than ordinary merit are termed 'authorized' and receive no subsidy. In 1907, there were of these 185 and they served 9,746 mares. In all cases a horse is required to serve fifty mares to obtain a premium. After the season a service record of mares is forwarded to the Department and, after foaling, a record of the foals is given. For draught horses, the service fee varies from 15 to 25 francs. Because of the subsidy, therefore, farmers are able to obtain the use of the best horses at very moderate rates. The encouragement given, through the premium system, to the possession of high-class sires has materially affected the quality and individuality of the horses bred in the district and the principle of the system has been one rather widely adopted in various European countries. The Scotch premium system is well known and Scotch breeders have a large faith in the advantage they have derived from it. In speaking with Mr. Wm. Montgomery, at Kirkcubright, he said: 'We know this system and it has given us the results we want.'

HORSE- BREEDING IN BELGIUM.

In Belgium, the nature of the Government assistance is of much the same character as that rendered through the premium system in France. Government inspection of stallions is obligatory and none may stand for public service except such as are accepted. The card of acceptance is of value for one year only and the official examination is an annual affair. In each district exhibitions or meets are held annually and first, second and sometimes a number of third prizes are awarded for two-year old, three-year old and aged horses, shown in their respective classes. The prizes vary from \$15 for a third to \$40, \$80 and \$110 for first prizes in the various sections. Special prizes of \$140 and \$180 are given at provincial exhibitions where a number of districts compete with their representatives. Another feature is the

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awarding of what are known as 'primes de conservation' which may be termed 'retaining premiums.' These are granted, in addition to the above mentioned prizes, for the purpose of retaining the horses for breeding purposes. Under ordinary conditions they vary from \$100 to \$160. When, in the annual inspection, a horse of exceptional value is found, the above mentioned premium may be replaced by one having a value of \$1,000 to \$1,200, this amount being payable each year for five years. In this instance, however, the conditions are very rigid and unless they are lived up to the premiums revert to the State. Horses receiving retaining premiums are usually required to serve special selected mares. It was learned that at one time special prizes had been granted to mares but that such were not now awarded.

In conversation with Mr. Prosper Mathieu, a large horse-owner and breeder of Brussels, he expressed himself as well satisfied with the working of the system in Belgium. He preferred the premium system to that of Government ownership of stallions. The uniformity of the horses throughout the country, particularly as regards confirmation, type and colour, could not but be noted and the animals bore the stamp of utility in a marked degree. There is a large market for draught horses in the seaport towns, such as Antwerp, but the biggest trade is with Germany. This country takes large importations every year and judging by figures which were received the Belgian horses are the most valuable of any purchased from foreign countries. It is partly in recognition of this trade that the Government has taken its interest in horse-breeding and the income which the farmers derive from the industry is an important part of their livelihood.

SUGGESTIVE WORK OF OTHER COUNTRIES.

It would be interesting to follow out the methods employed by other European countries in the way of government assistance to agricultural industries, but mention may be made of those of only one or two. During the last fifteen years the Government of Holland has taken an active interest in all matters pertaining to the manufacture of butter and cheese. Acts have been passed to regulate the industry and extend co-operation through instruction given on the farms in reference to the feeding and breeding of cattle and to the production of wholesome milk.

State schools and experiment stations have been opened and have become centres of information to those engaged in the work whether in the factory or on the farm. A system of State supervision has been inaugurated, through the agency of inspectors and control stations, with a view to improving the quality of the output, making it more uniform, and of giving to the makers the advantage of a Government guarantee in the disposal of their produce. The extent of the market and of the export trade warrants the Government in the support it gives and it would appear that, at the present time, Ireland and Holland are paralleling each other in the work they are doing in this connection.

Of Denmark, the advance this country has made in the production of bacon is well known, and the advantage that it has reaped through its trade on foreign markets. The efficiency of the Government assistance in reorganizing and recreating the bacon and dairy industries is a splendid illustration of what is really possible and of how effective such assistance may be. At the meeting of the British Association for the Advancement of Science, held in Winnipeg in 1909, the Danish Live Stock Commissioner described methods in use in Denmark which had resulted in raising the average yield of Danish cows from 80 lbs. butter in 1864, to 220 lbs. in 1908. This result has been obtained through the formation of local cattle breeders' associations, through which the bulls are purchased for use amongst the members; through a subsidy given for such bulls; through the formation of control unions which engage men to conduct tests for the farmers in connection with the milk-yield

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of their cows, the percentage of butter fat and the cost of feed; and again through the giving of prizes at fairs to cows and bulls in recognition, above all else, of their merit as breeders and producers. It is a recognized fact that, compared with Canada, in the production of milk and bacon the Danes are at a disadvantage through rate of rent for land and through cost of feed. Denmark, too, is a very small country and yet she has been able to obtain the best of the argument in competition for trade with Great Britain. The enterprise of the Government in co-operation with the farmers has made this possible and an income of millions of pounds annually has consequently resulted to the country.

CONCLUSIONS.

It is obviously difficult even if we appropriate the experience of other countries to suggest or recommend a policy that will be suitable for our own. Canada, through her provincial and federal Departments of Agriculture, has now, for a number of years, been formulating and developing policies, through the undertaking of which steady and definite progress has been made. It may well seem almost a truism, however, to say that the development of this country, agriculturally, will necessitate the consideration and adoption of measures of wider scope and purpose than have been either advisable or possible in the past. The extent of the territory and the variety of the interests involved, even including only those having to do directly with live stock, creates a situation which makes a comparison with the conditions obtaining in the other countries we have been studying almost out of the question. The primary principles, nevertheless, remain about the same.

The one fact that is emphasized perhaps more forcefully than any other by the experience of foreign countries, and for that matter by our own, is that without intensive effort in a definite direction and with particular application in individual communities, any general system of education or even of demonstration is likely to prove largely inoperative. Without the enthusiastic co-operation of the people themselves, it is impossible to get results commensurate with the money expended. In observing the methods of work in Europe, nothing was impressed upon the author more forcibly than the fact that government activity had to be carried directly to the country districts and the wheels of its enterprise set in motion there before it could expect to accomplish results. Contact with the people by actual demonstration is necessary before their support and co-operation can be obtained. It is not without faith, therefore, in the aim and direction of the substance of the schemes herein set forth that they are commended for consideration and, with necessary modifications, for adoption and application to the interests of the live stock industry in Canada.

The policy, to give point to what has already been suggested, in principle and in practice, must be eminently simple. It should consist in carrying the information obtained by scientific research and practical investigation direct to the farmer, not through the avenue of lectures and addresses only, but by practical demonstration and preferably by such demonstration as the farmers themselves shall set in operation. System in research is being more and more fully perfected every year, but system in practice of the results of such research has scarcely been more than conceived.

The individual community must constitute the unit in such a system of practice. There can be no better way of effecting improvement in horse-breeding, in cattle, sheep, pig and poultry breeding than, in the beginning at least, by stimulating and directing it in individual centres. The pork packers in Ireland pursue such a policy in their purchase and distribution of Yorkshire boars. In the Eastern states, the proprietors of condensing establishments have adopted a similar system in arranging for a supply of selected dairy bulls for their patrons. That a government

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is in a position to offer very great assistance in directing the practice of individual communities and of promoting co-operation amongst the members of each is unquestionable. A movement in this direction will constitute an active and powerful agency operating to counteract the evident tendency toward the merging of capital in the ownership of land, thus assisting to secure to the small holder the possession of his farm. Further, it will promote production and so develop the resources of the country as to give Canada a much larger place in the trade of the world.

United States authorities estimate that for every dollar expended in extension work there is a return of \$20 to the farms. A government now need fear no embarrassment in engaging itself in the operation of such measures as have been here proposed. The utility of such work has in recent years been somewhat widely demonstrated and in concerning itself in this aggressive fashion with the important industries of the rural districts, it may be assured of the backing and support not only of the farming population but, as well, of the approval and good-will of all the great business enterprises of the country.

APPENDIX No. 19.

Forms used in connection with Aid by Department to Thoroughbred Stallions.

FORM OF APPLICATION No. 1.

THOROUGHBRED STALLIONS.

(To be filled in and signed by applicant and forwarded to Live Stock Commissioner, Ottawa, as early as possible after opening of service season.)

Name of Stallion.....Number in Can. Stud Book.....
 Date of Birth.....
 Bred by.....Address,
 Owned by.....Address,
 In charge of.....Address,
 Location of Stallion for season 19.....
,

I purpose to stand for public service the above named stallion at.....
Province offor
 the full season 19 and hereby make application for the official inspection of the
 said horse which, if approved, will on fulfilment of the conditions hereinafter set forth,
 be eligible for the special grant offered by the Department of Agriculture at Ottawa
 in aid of Thoroughbred horses.

1. Certificate of registration to be produced and identity of horse proven when the horse is inspected.

2. Stallion and place or places at which he will be available for service during the season to be properly and fully advertised by poster and by announcements in the local press.

3. The service fee for any mare, not being a Thoroughbred, to be not more than \$10 to insure, such service fee to become due and payable only when mare proves to be in foal.

4. Evidence satisfactory to the Department to be furnished at the close of the season that the horse has served a reasonable number of mares, other than Thoroughbred mares, age of horse and district in which the season is made to be duly considered.

5. In the event of any horse being incapacitated through death, illness or accident, before the proper conclusion of his season, the Department to be at once notified and at the same time informed as to whether or not it is the intention of the owner or controller to provide an approved substitute.

(Signature of Applicant).....

Dated at.....

This.....day of..... 19.....

APPENDIX No. 20.

REPORT No. 4 OF THE CANADIAN RECORD OF PERFORMANCE.

INTRODUCTION.

That the importance of an official record of production in breeding stock is each year becoming more generally recognized by dairymen in Canada is clearly indicated by the steady growth in the work of the Record of Performance and by the prominence which is given to R.O.P. tests in the advertisements and sale-catalogues of breeders. Owners of pure bred herds with young stock to sell are finding that the faith of the public in spectacular records made in short tests of seven or thirty days has to a certain extent been shaken and that there is an increasing demand for a more substantial evidence of merit in the ancestry of the animals selected. A certificate of qualification in the Record of Performance test covering, as it does, the production for the full milking period of a cow carrying a calf provides such evidence and, in consequence, possesses a value which the progressive dairyman cannot afford to ignore.

While this phase of the work of the Live Stock Branch is thus of very great and direct benefit to the pure bred stockmen, it has an even wider influence in furnishing to the owners of grade herds reliable and valuable information to govern the selection of bulls to place at the head of their herds. The justification of the undertaking of the work in the first place lay, in a large measure, in this fact and already there has been ample demonstration of appreciation, on the part of dairymen in general, of the advantage thus afforded. The ultimate improvement in the dairy stock of the country which will be attained as a result of this form of assistance cannot, therefore, be even estimated.

As was foreshadowed in the report of last year, the expansion of the work has necessitated the appointment of additional inspectors. Whereas, a year ago a staff of three men in the field were, under the direction of the Chief Inspector, endeavouring to keep up with the work in Ontario and Quebec, six inspectors are now devoting all of their time to the supervision of tests in these provinces and a special inspector has been appointed for the Maritime Provinces. In the Western Provinces the work has also increased but has not yet reached a point to justify the appointment of inspectors in each Province. Accordingly, as in the past, arrangements have been made through the Provincial Departments for all inspections in the Provinces of Alberta and Saskatchewan, while in British Columbia the work, as from time to time required has been performed by an officer furnished under a special arrangement by the Dairy Commissioner of the Federal Department.

During the past year some notably high yields were recorded and previous Canadian Records, and even World's Records in different classes, were beaten. The attention attracted by these creditable performances, however, indicates a tendency on the part of the public to form a misconception of the purpose of the work. It is, therefore, perhaps opportune to emphasize the fact that the Record of Performance is not a competitive institution. Its aim is rather to develop and perpetuate high producing strains of dairy stock under normal conditions of management and feeding. The danger of sacrificing thrift and hardiness for abnormal production cannot be too strenuously guarded against by breeders.

For some time there has been a growing demand on the part of breeders that some recognition be given to cows which qualify in so far as yield in milk and butterfat

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is concerned, but which fail to calve within fifteen months after the commencement of the test. In view of the fact that such records have a value as evidence of capacity for production the Minister has this year consented to the publishing of them in future in an Appendix to the Report of the Record of Performance. No certificates for records so published will, however, be issued.

The total number of cows entered, as well as the total number which have qualified in the intervals preceding the issuing of the four reports published to date is set forth in the following tables. It will be noted that the column for 1908 includes all cows entered and qualifying during the two years and a half preceding the issuing of the Report on July 1st of that year. The column for 1910 summarizes the results for a period of one year and nine months, while those for 1910 and 1911 each contain one year's figures. Since the date of calving after completing the test has a bearing on the qualification of a cow, the result of the test of all the cows entered in one interval is not known at the end of the succeeding interval and it is, consequently, not possible to determine exactly the percentage qualifying.

SUMMARY FOR PERIOD PRECEDING THE ISSUING OF EACH REPORT.

NO. OF COWS ENTERED.

	July 1, 1908.	March 31, 1910.	March 31, 1911.	March 31, 1912.
Holsteins.....	194	227	244	399
Ayrshires.....	345	227	250	301
Jerseys.....	11	6	52	70
Guernseys.....		13	12	19
French Canadians.....	11	47	28	12
	561	520	586	801

QUALIFIED.

	6	76	75	77
Holsteins.....	37	52	52	72
Ayrshires.....		3	3	7
Jerseys.....			5	2
Guernseys.....	1	4	10	2
French Canadians.....				
	44	135	145	160

Feed Reports.

While a low average yield per cow is undoubtedly one of the greatest drawbacks to successful dairying in Canada to-day, there is another factor influencing the final profit which should receive more attention at the hands of dairymen than it does—that of cost of production. Recognizing this fact, the Department is now utilizing its Inspectors in the Record of Performance in collecting exact information regarding the ration fed to each cow entered in the test.

Since the first of January, 1912, each inspector has been required to obtain, in so far as possible, the exact weight of each kind of feed fed during the time of his visit to each cow whose test he supervised. Using prices intended to represent an average for a term of years, the feed has been charged against the production and the cost

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per cwt. of milk and per lb. of fat, in so far as the feed is concerned, worked out. The feed record is of course entirely independent of the Record of Performance and, consequently, imposes no handicap upon cows entered.

The work has not as yet been in progress long enough to justify the making of extensive deductions from the data thus obtained. That the providing of abundance of roughage of good quality and the feeding of grain in proportion to production are important factors in cheapening cost has, however, been clearly indicated by the information already secured. The influence of high yield upon the cost per cwt. has also been very evident. As an illustration of this point, the feed reports received during a period of six weeks in mid-winter for all cows giving upwards of 30 lbs. of milk per day were tabulated in four classes—cows giving 30-40 lbs., 40-50 lbs., 50-60 lbs., and upwards of 60 lbs. per day. Ayrshire, Holstein and Jersey cows of all ages and in different periods of lactation were included in the comparison. They were, moreover, representative of many different herds under widely varying conditions of management and feeding and yet when the average cost of the feed per cwt. of milk for each class was worked out it illustrated, in a striking manner, the principle that high yield is invariably associated with cheapness of production. The costs averaged as follows:—

Cows giving 30-40 lbs. per day	77c. per cwt.
“ “ 40-50 “ “ “	66c. “ “
“ “ 50-60 “ “ “	57c. “ “
“ “ 60 lbs. and up “	51c. “ “

The obtaining of these feed reports has naturally depended very largely upon the co-operation of the breeders and it is fitting that the cheerful manner in which this assistance has been given should be frankly acknowledged. The interest taken by the herd owners in this new feature has, in fact, exceeded the expectations of the Department and it is felt that as the investigation progresses information of great value to dairymen will result.

Rules and Regulations.

Following are the rules and regulations governing the Record of Performance tests:—

SCOPE OF TESTS.

All tests will be for a period not exceeding 365 consecutive days.

ELIGIBILITY OF ANIMALS.

All animals entered for the test must previously be registered in the Canadian Herd Book, for the breed to which they belong.

CLASSIFICATION OF ANIMALS.

Cows from 2 to 3 years old shall be in a class known as 2-year-old.

Cows from 3 to 4 years old shall be in a class known as 3-year-old.

Cows from 4 to 5 years old shall be in a class known as 4-year-old.

Cows 5 years old and over shall be in a class known as mature.

In the 4-year-old class and the mature class, no cow will be accepted for entry if the beginning of her previous lactation period was more than fifteen months before the commencement of the test. Every cow under test must drop a calf within fifteen months after the beginning of her testing period, in order to qualify for registration of performance.

No milk from a second freshening within the 365 days will be considered in a test.

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DUTIES OF OWNER.

It is desirable that entries of cows for test be made before calving. Application for entry of cows will in no case be accepted if not mailed within thirty days after calving.

The owner of a cow entered in the test shall weigh, or cause to be weighed, each milking and keep a correct record of the same on forms furnished for the purpose.

At the end of each month the owner shall report on forms furnished for the purpose:—

(a) A record of the weights of each milking, with the total yield of milk from each cow for the month.

(b) An approximate statement of the amount and kinds of feed given, and data concerning stabling and care of the animals.

NOTE—Monthly reports should be mailed within ten days after each monthly period. Such reports must reach the office of the Live Stock Commissioner before the end of the succeeding month.

As soon as possible after the calving of a cow whose test has been completed, the owner shall send in on Form IV a statement compiled from the monthly reports of the year's milk record, the same having been sworn to before a Notary Public or Justice of the Peace.

The owner of a cow entered in the test shall provide board and lodging for the inspector during his official visits and shall convey him, when leaving, to the railway station, or the next farm to be visited, free of charge.

DUTIES OF INSPECTORS.

An inspector shall visit the stable at least eight times during the year, at irregular intervals and unannounced. He shall remain for at least two full days, covering all the milkings of that period, at each visit. During this time he shall weigh the milk of each cow under test, at each milking, and take samples of each for a composite sample for Babcock test. These tests shall be the basis for computing the record. He shall see that the samples are in no manner interfered with; when not under the inspector's eye the samples must be under lock and key or sealed.

The inspector shall in each case complete the test for fat before leaving for the next place to be visited and should, as far as possible, make tests in the presence of the owner or of interested parties.

The inspector may insist upon only one of the animals under the test being milked at a time during inspection.

He shall compare at each visit the owner's scale with his own and report any difference that he may observe.

The inspector shall take a copy of the owner's milk record for the two days immediately preceding his visit.

A statement of the feed fed to each cow shall be reported upon forms furnished for the purpose.

Any sickness of cows and other disturbing influences shall be noted. If such sickness of an animal should occur at the time of a visit the inspector may defer the test of this animal to another date.

The inspector must send to the Live Stock Commissioner, Ottawa, as soon as possible after each visit, a report of said visit on forms furnished for the purpose.

APPLICATION FOR TEST.

Application for the test should be made before calving and must be mailed within thirty days after calving to the secretary of the Canadian Association for the breed to which the animal belongs, and accepted by him as eligible.

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Upon receipt of said application, signed by said secretary, the Live Stock Commissioner will forward to the address of the applicant blank forms and other information and arrange for official inspection.

The Dominion Department of Agriculture undertakes the supervision of these yearly tests of cows through the various breed associations. Only such cows will be tested as are of the breeds, whose respective associations have officially recognized the tests outlined, and have agreed to publish in connection with their Herd Book the records of the animals fulfilling the standards required.

A report of the performance of each animal that has qualified for registration will be forwarded to the Secretary of the Canadian Association representing the breed at the conclusion of the testing period.

The above rules and requirements are subject to change at the discretion of the Minister of Agriculture.

J. G. RUTHERFORD,

Live Stock Commissioner.

THE STANDARDS FOR REGISTRATION.

Ayrshire.

Bulls—Admitted after having four daughters in the Record of Performance, each from a different dam.

Cows—Admitted after fulfilling the following requirements of production and breeding as supervised by the Live Stock Branch of the Department of Agriculture.

All cows admitted must equal or exceed both the records specified below:—

	Lbs. Milk.	Lbs. Butter Fat.
Two-year-old class	5,500	198
Three-year-old class	6,500	234
Four-year-old class	7,500	270
Mature class	8,500	306

The per cent of butter fat shall be determined by Babcock test.

Year's Milk Record—If the test be commenced the day the animal is two years old or previous to that day, she must produce within 365 consecutive days from the date, 5,500 pounds of milk. For each day the animal is over two years old at the beginning of her year's test, the amount of milk she will be required to produce in the year will be determined by adding 2.75 pounds for each such day to the 5,500 pounds required when in the two-year-old class. This ratio is applicable until the animal is five years old, when the required amount will have reached 8,500 pounds which will be the minimum amount of milk required of all cows five years old and over.

Year's Butter Fat Record—If test be commenced the day the animal is two years old or previous to that day, she must produce within 365 consecutive days from that date, 198 pounds of butter fat. For each day the animal is over two years old at the beginning of her year's test, the amount of butter fat she will be required to produce in one year will be determined by adding .1 (one-tenth) of a pound for each such day to the 198 pounds required when in the two-year-old class. This ratio is applicable until the animal is five years old when the required amount will have reached 306 pounds, which will be the minimum amount of butter fat required of all cows five years old and over.

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Every cow accepted for registration of performance must drop a calf within fifteen months after the commencement of the test. In the four-year-old class and the mature class, no cows will be accepted for registration of performance if the beginning of her previous lactation period was more than fifteen months before the commencement of the test.

All applications for the test must be mailed to W. F. Stephen, Huntingdon, Quebec, secretary of the Canadian Ayrshire Breeders' Association.

French Canadian.

Bulls—Admitted after having four daughters in the Record of Performance, each from a different dam.

Cows—Admitted after fulfilling the following requirements of production and breeding as supervised by the Live Stock Branch of the Department of Agriculture.

All cows admitted must equal or exceed both the records specified below:—

	Lbs. Milk.	Lbs. Butter	Fat.
Two-year-old class...	4,400	198	
Three-year-old class...	5,200	234	
Four-year-old class...	6,000	270	
Mature class...	6,800	306	

The per cent of butter fat shall be determined by Babcock test.

Year's Milk Record—If the test be commenced the day the animal is two years old or previous to that day, she must produce within 365 consecutive days from that date, 4,400 pounds of milk. For each day the animal is over two years old at the beginning of her year's test, the amount of milk she will be required to produce in the year will be determined by adding 2.2 pounds for each such day to the 4,400 pounds required when in the two-year-old class. This ratio is applicable until the animal is five years old, when the required amount will have reached 6,800 pounds which will be the minimum amount of milk required of all cows five years old and over.

Year's Butter Fat Record—If test be commenced the day the animal is two years old, or previous to that day, she must produce within 365 consecutive days from that date, 198 pounds of butter fat. For each day the animal is over two years old at the beginning of her year's test, the amount of butter fat she will be required to produce in one year will be determined by adding .1 (one-tenth) of a pound for each such day to the 198 pounds required when in the two-year-old class. This ratio is applicable until the animal is five years old when the required amount will have reached 306 pounds, which will be the minimum amount of butter fat required of all cows five years old and over.

Every cow accepted for registration of performance must drop a calf within fifteen months after the commencement of the test. In the four-year-old class and the mature class, no cows will be accepted for registration of performance if the beginning of her previous lactation period was more than fifteen months before the commencement of the test.

All applications for the test must be mailed to Dr. J. A. Couture, 49 Garden St., Quebec, secretary of the French-Canadian Cattle Breeders' Association

Guernsey.

Bulls—Admitted after having four daughters in the Record of Performance, each from a different dam.

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Cows—Admitted after fulfilling the following requirements of production and breeding as supervised by the Live Stock Branch of the Department of Agriculture. All cows admitted must equal or exceed both the records specified below:—

	Lbs. Milk.	Lbs. Butter Fat
Two-year-old class...	5,000	200
Three-year-old class...	6,000	240
Four-year-old class...	7,000	280
Mature class...	8,000	320

The per cent of butter fat shall be determined by Babcock test.

Year's Milk Record—If the test be commenced the day the animal is two years old or previous to that day, she must produce within 365 consecutive days from that date, 5,000 lbs. of milk. For each day the animal is over two years old at the beginning of her year's test, the amount of milk she will be required to produce in the year will be determined by adding 2.75 lbs. for each day to the 5,000 lbs. required when in the two-year-old class. This ratio is applicable until the animal is five years old, when the required amount will have reached 8,000 lbs., which will be the minimum amount of milk required of all cows five years old or over.

Year's Butter Fat Record—If test be commenced the day the animal is two years old, or previous to that day, she must produce within 365 consecutive days from that date, 200 lbs. of butter fat. For each day the animal is over two years old at the beginning of her year's test, the amount of butter fat she will be required to produce in one year will be determined by adding .11 (eleven one-hundredths) of a pound for each such day to the 200 lbs. required when in the two-year-old class. This ratio is applicable until the animal is five years old when the required amount will have reached 320 lbs. which will be the minimum amount of butter fat required of all cows five years old and over.

Every cow accepted for registration of performance must drop a calf within fifteen months after the commencement of the test. In the four-year-old class and the mature class, no cows will be accepted for registration of performance if the beginning of her previous lactation period was more than fifteen months before the commencement of the test.

All applications for the test must be mailed to Howard W. Corning, Chegoggin, N.S., secretary of the Canadian Guernsey Breeders' Association.

Holstein-Friesian.

Bulls—Admitted after having four daughters in the Record of Performance, each from a different dam.

Cows—Admitted after fulfilling the following requirements of production and breeding as supervised by the Live Stock Branch of the Department of Agriculture. All cows admitted must equal or exceed both the records specified below:—

	Lbs. Milk.	Lbs. Butter Fat.
Two-year-old class...	7,500	255
Three-year-old class...	8,500	289
Four-year-old class...	9,500	323
Mature class...	10,500	357

The per cent of butter fat shall be determined by Babcock test.

Year's Milk Record—If the test be commenced the day the animal is two years old, or previous to that day, she must produce within 365 consecutive days from that date 7,500 lbs. of milk. For each day the animal is over two years old at the

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beginning of her year's test, the amount of milk she will be required to produce in the year will be determined by adding 2.75 lbs. for each such day to the 7,500 lbs. required when in the two-year-old class. This ratio is applicable until the animal is five years old, when the required amount will have reached 10,500 lbs., which will be the minimum amount of milk required of all cows five years old and over.

Year's Butter Fat Record—If test be commenced the day the animal is two years old, or previous to that day, she must produce within 365 consecutive days from that date, 255 lbs. of butter fat. For each day the animal is over two years old at the beginning of her year's test, the amount of butter fat she will be required to produce in one year will be determined by adding .0931 of a lb. for each day to the 255 lbs. required when in the two-year-old class. This ratio is applicable until the animal is five years old, when the required amount will have reached 357 lbs., which will be the minimum amount of butter fat required of all cows five years old and over.

Every cow accepted for registration of performance must drop a calf within fifteen months after the commencement of the test. In the four-year-old class and the mature class, no cows will be accepted for registration of performance if the beginning of her previous lactation period was more than fifteen months before the commencement of the test.

All applications for the test must be mailed to G. W. Clemons, St. George, Ont., secretary of the Canadian Holstein-Friesian Breeders' Association.

. Jersey.

Bulls.—Admitted after having four daughters in the Record of Performance, each from a different dam.

Cows.—Admitted after fulfilling the following requirements of production and breeding as supervised by the Live Stock Branch of the Department of Agriculture.

All cows admitted must equal or exceed both the records specified below:—

	Lbs. Milk.	Lbs. Butter Fat.
Two-year-old class...	5,500	218
Three-year-old class...	6,500	257
Four-year-old class...	7,500	297
Mature class...	8,500	337

The per cent of butter fat shall be determined by Babcock test.

Year's Milk Record.—If the test be commenced the day the animal is two years old, or previous to that day, she must produce within 365 consecutive days from that date, 5,500 lbs. of milk. For each day the animal is over two years old at the beginning of her year's test, the amount of milk she will be required to produce in the year will be determined by adding 2.75 lbs., for each such day to the 5,500 lbs. required when in the two-year-old class. This ratio is applicable until the animal is five years old, when the required amount will have reached 8,500 lbs., which will be the minimum amount of milk required of all cows five years old and over.

Year's Butter Fat Record.—If test be commenced the day the animal is two years old or previous to that day, she must produce within 365 consecutive days from that date, 218 lbs. of butter fat. For each day the animal is over two years old at the beginning of her year's test the amount of butter fat she will be required to produce in one year will be determined by adding .11 (eleven one hundredths) of a pound for each such day to the 218 lbs. required when in the two-year-old class. This ratio is applicable until the animal is five years old, when the required amount will have reached 337 lbs., which will be the minimum amount of butter fat required of all cows five years old and over.

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Every cow accepted for registration of performance must drop a calf within fifteen months after the commencement of the test. In the four-year-old class and the mature class, no cow will be accepted for registration of performance if the beginning of her previous lactation period was more than fifteen months before the commencement of the test.

All applications for the test must be mailed to R. Reid, Berlin, Ont., secretary of the Canadian Jersey Cattle Club.

AYRSHIRE.

COWS FIVE YEARS OLD AND OVER.

Production required for registration: milk, 8,500 lbs.; fat, 306 lbs.

- No. 143. 'Kirsty 3rd of Neidpath,' No. 14559.
 Sire, 'Laird O'Thorncliffe,' No. 9982.
 Dam, 'White Legged Kirsty of Auchenbrain,' No. 2020.
 Bred and owned by W. W. Ballantyne, Stratford, Ont.
 Test commenced, March 10, 1910.
 Age at commencement of test, 9 years.
 Date of calving, March 9th, 1910.
 Date of previous calving, April 14th, 1909.
 Date of calving following test, April 26th, 1911.
 Average per cent of fat, 3.26; days in milk, 365.
 Total production, milk, 11,903.5 lbs.; fat, 388.54 lbs.
- No. 149. 'Lizzie Glen of Ste. Anne's,' No. 16147.
 Sire, 'Glencairn, 3rd,' No. 6955.
 Dam, 'Lizzie 5th of Auchenbrain,' No. 12292.
 Owned by Macdonald College, Macdonald College, Que.
 Bred by R. Reford, Ste. Anne de Bellevue, Que.
 Test commenced, March 11, 1910.
 Age at commencement of test, 7 years.
 Date of calving, March 11, 1910.
 Date of previous calving, December 23, 1908.
 Date of calving after test, May 10, 1911.
 Average per cent of fat, 4.00; days in milk, 333.
 Total production, milk, 9,116 lbs.; fat, 365.29 lbs.
- No. 152. 'Pet of Hickory Hill,' No. 21259.
 Sire, 'Dairyman of Glenora,' No. 13475.
 Dam, 'Flower of Hickory Hill,' No. 12031.
 Bred and owned by N. Dymont, Clappison, Ont.
 Test commenced, January, 11, 1910.
 Age at commencement of test, 6 years and 316 days.
 Date of calving, January 1, 1910.
 Date of previous calving, December 5, 1908.
 Date of calving after test, March 29, 1911.
 Average per cent of fat, 4.10; days in milk, 354.
 Total production, milk, 13,191 lbs.; fat, 542.18 lbs.

SESSIONAL PAPER No. 15b

- No. 153. '**Flower of Metcalfe**,' No. 30405.
Sire, '**Neidpath Chief**,' No. 2142.
Dam, '**Flora of Metcalfe**,' No. 30257.
Owned by A. S. Turner & Son, Ryckman's Corners, Ont.
Bred by Frank Inch, Kerrwood, Ont.
Test commenced, May 22, 1910.
Age at commencement of test, 8 years.
Date of calving, May 22, 1910.
Date of previous calving, April 7, 1909.
Date of calving after test, June 26, 1911.
Average per cent of fat, 4.02; days in milk, 276.
Total production, milk, 9,157.45 lbs.; fat, 368.70 lbs.
- No. 154. '**Flora of Metcalfe**,' No. 30257.
Sire, '**Metcalfe Chief**,' No. 1784.
Dam, '**Flora 2nd**,' No. 3253.
Owned by A. S. Turner & Son, Ryckman's Corners, Ont.
Bred by Frank Inch, Kerrwood, Ont.
Test commenced, May 6, 1910.
Age at commencement of test, 10 years.
Date of calving, May 5, 1910.
Date of previous calving, April 10, 1909.
Date of calving after test, July 1, 1911.
Average per cent of fat, 3.59; days in milk, 365.
Total production, milk, 11,908.85 lbs.; fat, 427.34 lbs.
- No. 155. '**Brownie**,' No. 13188.
Sire, '**Rob Roy of Brookside**,' No. 9799.
Dam, '**Nancy**,' No. 2175.
Owned by John McKee, Norwich, Ont.
Bred by H. & J. McKee, Norwich, Ont.
Test commenced, July 9, 1910.
Age at commencement of test, 10 years.
Date of calving, July 5, 1910.
Date of previous calving, July 2, 1909.
Date of calving after test, August 10, 1911.
Average per cent of fat, 4.15; days in milk, 330.
Total production, milk, 8,730.6 lbs.; fat, 362.31 lbs.
- No. 156. '**Lady Cairn**,' No. 14428.
Sire, '**Prince Cairn**,' No. 10500.
Dam, '**Lady Cameron**,' No. 1740.
Owned by Wm. Thorn, Lynedock, Ont.
Bred by F. T. Guy, Darlington, Ont.
Test commenced, April 8, 1910.
Age at commencement of test, 8 years.
Date of calving, March 30, 1910.
Date of previous calving, April 25, 1909.
Date of calving after test, June 15, 1911.
Average per cent of fat, 3.55; days in milk, 307.
Total production, milk, 9,051.55 lbs.; fat, 322.25 lbs.
- No. 159. '**May Beauty**,' No. 12400.
Sire, '**White Prince 2nd**,' No. 808.
Dam, '**Queen May**,' No. 2815.
Owned by Wm. Stewart & Son, Menie, Ont.

3 GEORGE V., A. 1913

Bred by J. H. Douglas, Warkworth, Ont.
Test commenced, April 16, 1910.
Age at commencement of test, 11 years.
Date of calving, April 13, 1910.
Date of previous calving, April 1, 1909.
Date of calving after test, April, 1911.
Average per cent of fat, 3.88; days in milk, 321.
Total production, milk, 9,580 lbs.; fat, 372.24 lbs.

No. 164. '**Mabel**,' No. 12768.
Sire, '**Marquis of Neidpath**,' No. 2031.
Dam, '**Lady Douglas**,' No. 2165.
Owned by Jas. Begg, St. Thomas, Ont.
Bred by John Crosby, Campbellford, Ont.
Test commenced, March 2, 1910.
Age at commencement of test, 10 years.
Date of calving, March 1, 1910.
Date of previous calving, March 1, 1909.
Date of calving after test, May 11, 1911.
Average per cent of fat, 3.86; days in milk, 365.
Total production, milk, 8,872.75 lbs.; fat, 342.90 lbs.

No. 171. '**Dairymaid**,' No. 13847.
Sire, '**Caspian of Ste. Anne's**,' No. 8893.
Dam, '**Dairymaid's Maid**,' No. 3445.
Owned by H. C. Hamill, Box Grove, Ont.
Bred by A. Hume & Co., Menie, Ont.
Test commenced, March 1, 1910.
Age at commencement of test, 9 years.
Date of calving, February 28, 1910.
Date of previous calving, January 15, 1909.
Date of calving after test, April 8, 1911.
Average per cent of fat, 3.72; days in milk, 321.
Total production, milk, 8,968 lbs.; fat, 333.97 lbs.

No. 172. '**Sarah of Brookside**,' No. 17842.
Sire, '**Bobs**,' No. 13187.
Dam, '**Sarah 2nd**,' No. 13192.
Owned by John McKee, Norwich, Ont.
Bred by H. & J. McKee, Norwich, Ont.
Test commenced, October 7, 1910.
Age at commencement of test, 6 years and 335 days.
Date of calving, October 3, 1910.
Date of previous calving, September 24, 1909.
Date of calving after test, November 9, 1911.
Average per cent of fat, 4.00; days in milk, 314.
Total production, milk, 9,711 lbs.; fat, 388.88 lbs.

No. 173. '**Annie of Warkworth**,' No. 21493.
Sire, '**Jack of Warkworth**,' No. 15790.
Dam, '**Ida of Warkworth**,' No. 15707.
Owned by Alex. Hume & Co., Menie, Ont.
Bred by John H. Douglas, Warkworth, Ont.
Test commenced, November 24, 1910.
Age at commencement of test, 5 years and 310 days.
Date of calving, November 22, 1910.

SESSIONAL PAPER No. 15b

Date of previous calving, September 1, 1909.
 Date of calving after test, November 7, 1911.
 Average per cent of fat, 4.16; days in milk, 275.
 Total production, milk, 9,383.5 lbs.; fat, 390.99 lbs.

No. 176. 'Daisy 1st of Brookside,' No. 13785.

Sire, 'Rob Roy of Brookside,' No. 9799.
 Dam, 'Sprightly,' No. 13193.
 Owned by John McKee, Norwich, Ont.
 Bred by H. & J. McKee, Norwich, Ont.
 Test commenced, November 18, 1910.
 Age at commencement of test, 10 years.
 Date of calving, November 14, 1910.
 Date of previous calving, November 13, 1909.
 Date of calving after test, November 22nd, 1911.
 Average per cent of fat, 4.14; days in milk, 284.
 Total production, milk, 8,533.2 lbs.; fat, 353.00 lbs.

No. 182. 'Daisy 4th of Neidpath,' No. 17937.

Sire, 'Royal Peter of Ste. Anne's,' No. 13140.
 Dam, 'Daisy 1st of Auchenbrain,' No. 2023.
 Bred and owned by W. W. Ballantyne, Stratford, Ont.
 Test commenced, October 13, 1910.
 Age at commencement of test, 7 years and 263 days.
 Date of calving, October 12, 1910.
 Date of previous calving, October 9, 1909.
 Date of calving after test, December 17, 1911.
 Average per cent of fat, 4.11; days in milk, 365.
 Total production, milk, 9,889.7 lbs.; fat, 406.41 lbs.

No. 187. 'Dairymaid,' No. 24702.

Sire, 'Jock Marsfield,' No. 2434.
 Dam, 'Annie Laurie,' No. 2602.
 Owned by And. McRae & Sons, East Royalty, P.E.I.
 Bred by Wm. Miller, Marshfield, P.E.I.
 Test commenced, November 1, 1910.
 Age at commencement of test, 6 years.
 Date of calving, October 22, 1910.
 Date of previous calving, August 16, 1909.
 Date of calving after test, December 11, 1911.
 Average per cent of fat, 5.16; days in milk, 365.
 Total production, milk, 11,100 lbs.; fat, 572.77 lbs.

No. 190. 'Snowflake,' No. 19739.

Sire, 'Glenora Sultan,' No. 10338.
 Dam, 'Helena,' No. 3356.
 Owned by A. S. Turner & Son, Ryckman's Corners, Ont.
 Bred by Jas. McCormick & Son, Rockton, Ont.
 Test commenced, December 6, 1910.
 Age at commencement of test, 9 years and 233 days.
 Date of calving, December 5, 1910.
 Date of previous calving, October 10, 1909.
 Date of calving after test, December 27, 1911.
 Average per cent of fat, 4.41; days in milk, 299.
 Total production, milk, 12,616.1 lbs.; fat, 556.79 lbs.

- No. 195. '**Star's Alpha**,' No. 17839.
Sire, '**Royal Star of Ste. Anne's**,' No. 7916.
Dam, '**Daisy 1st of Brookside**,' No. 13785.
Owned by E. Cohoon, Harrietsville, Ont.
Bred by H. & J. McKee, Norwich, Ont.
Test commenced, February 11, 1910.
Age at commencement of test, 6 years and 139 days.
Date of calving, February 10, 1910.
Date of previous calving, January 22, 1909.
Date of calving after test, March 10, 1911.
Average per cent of fat, 3.94; days in milk, 308.
Total production, milk, 9,305.6 lbs.; fat, 366.50 lbs.
- No. 202. '**Buttercup**,' No. 24187.
Sire, '**Sultan of the Willows**,' No. 15310.
Dam, '**Primrose 9th**,' No. 3012.
Owned by W. J. Carlyle, Chesterville, Ont.
Bred by John Campbell, Dalmeny, Ont.
Test commenced, March 24, 1911.
Age at commencement of test, 7 years.
Date of calving, March 22, 1911.
Date of previous calving, February 25, 1910.
Date of calving after test, March 3, 1912.
Average per cent of fat, 3.60; days in milk, 283.
Total production, milk, 10,623 lbs.; fat, 382.79 lbs.
- No. 205. '**Eileen**,' No. 18220.
Sire, '**Gladstone 2nd**,' No. 9225.
Dam, '**Dorcas**,' No. 11568.
Owned by G. D. Mode, Vankleek Hill, Ont.
Bred by Wm. Grier, Ormstown, Que.
Test commenced, November 24, 1910.
Age at commencement of test, 3 years.
Date of calving, November 21, 1910.
Date of previous calving, September 16, 1909.
Date of calving after test, February 19, 1912.
Average per cent of fat, 4.59; days in milk, 365.
Total production, milk, 13,825.75 lbs.; fat, 635.48 lbs.
- No. 206. '**Sybella of Springbank**,' No. 27691.
Sire, '**Hamilton Chief**,' No. 17491.
Dam, '**Lady White of Springbank**,' No. 27690.
Bred and Owned by A. S. Turner & Son, Ryckman's Corners, Ont.
Test commenced, March 21, 1911.
Age at commencement of test, 5 years and 212 days.
Date of calving, March 20, 1911.
Date of previous calving, January 1, 1910.
Date of calving after test, March 13, 1912.
Average per cent of fat, 3.74; days in milk, 307.
Total production, milk, 11,468.8 lbs.; fat, 428.68 lbs.
- No. 207. '**Alice of Kerwood**,' No. 30387.
Sire, '**Neidpath Chief**,' No. 2142.
Dam, '**Alice of Byron**,' No. 485.
Owned by A. S. Turner & Son, Ryckman's Corners, Ont.
Bred by Frank Inch, Kerwood, Ont.

SESSIONAL PAPER No. 15b

Test commenced, April 24, 1911.
 Age at commencement of test, 7 years and 39 days.
 Date of calving, April 23, 1911.
 Date of previous calving, March 8, 1910.
 Date of calving after test, March 9, 1912.
 Average per cent of fat, 3.95; days in milk, 283.
 Total production, milk, 10,030.7 lbs.; fat, 396.36 lbs.

No. 211. '**Wexford Blood**,' No. 16720.
 Sire, '**Dan of Auchenbrain**,' No. 3959.
 Dam, '**Wexford Miss Wallace**,' No. 418.
 Owned by Macdonald College, Macdonald College, Que.
 Bred by Robt. Taylor, Symington, Scotland.
 Test commenced, December 23, 1910.
 Age at commencement of test, 9 years.
 Date of calving, December 22, 1910.
 Date of previous calving, December 3, 1909.
 Date of calving after test, March 22, 1912.
 Average per cent of fat, 4.1; days in milk, 337.
 Total production, milk, 9,719.50 lbs.; fat, 402.75 lbs.

No. 212. '**Rose of Senneville**,' No. 20376.
 Sire, '**The Don**,' No. 8855.
 Dam, '**Red Rose of Senneville**,' No. 12027.
 Owned by Geo. H. Montgomery, Philipsburg, Que.
 Bred by R. B. Angus, Senneville, Que.
 Test commenced, January 9, 1911.
 Age at commencement of test, 7 years.
 Date of calving, January 7, 1911.
 Date of previous calving, December 24, 1909.
 Date of calving after test, February 28, 1912.
 Average per cent of fat, 3.82; days in milk, 356.
 Total production, milk, 10,144.5 lbs.; fat, 394.28 lbs.

COWS FOUR YEARS OLD AND UNDER FIVE.

No. 147. '**Julia**,' No. 23580.
 Sire, '**Major**,' No. 23467.
 Dam, '**Sprightly of Tanglewyld**,' No. 17883.
 Bred and owned by Wooddisse Bros., Rothsay, Ont.
 Test commenced, April 7, 1910.
 Age at commencement of test, 4 years and 155 days.
 Date of calving, April 7, 1910.
 Date of previous calving, March 18, 1909.
 Date of calving after test, May 17, 1911.
 Average per cent of fat, 4.82; days in milk, 365.
 Total production, milk, 9,753.25 lbs.; fat, 470.31 lbs.
 Production required for registration—milk, 7,926.25 lbs.; fat, 285.5 lbs.

No. 150. '**Daisy**,' No. 23582.
 Sire, '**McCormack**,' No. 15944.
 Dam, '**White Rose of Tanglewyld**,' No. 17884.
 Bred and owned by Wooddisse Bros., Rothsay, Ont.
 Test commenced, March 2, 1910.
 Age at commencement of test, 4 years and 132 days.

Date of calving, March 1, 1910.
Date of previous calving, February 11, 1909.
Date of calving after test, March 3, 1911.
Average per cent of fat, 4.24; days in milk, 300.
Total production, milk, 8,679 lbs.; fat, 367.93 lbs.
Production required for registration—milk, 7,863 lbs.; fat, 283.2 lbs.

- No. 151. '**Maud of Hillview**,' No. 23671.
Sire, '**Champion of Beaver Meadow**,' No. 14519.
Dam, '**Laura of Hillview**,' No. 20279.
Owned by W. J. Carlyle, Chesterville, Ont.
Bred by Carlyle Bros., Morewood, Ont.
Test commenced, April 8, 1910.
Age at commencement of test, 4 years and 26 days.
Date of calving, April 6, 1910.
Date of previous calving, April 10, 1909.
Date of calving after test, May 18, 1911.
Average per cent of fat, 3.69; days in milk, 327.
Total production, milk, 9,028 lbs.; fat, 333.5 lbs.
Production required for registration—milk, 7,571.5 lbs.; fat, 272.6 lbs.

- No. 180. '**Scotland Princess 2nd**,' No. 23495.
Sire, '**Polar Star**,' No. 16118.
Dam, '**Annie Laurie**,' No. 2492.
Owned by A. S. Turner & Son, Ryckman's Corners, Ont.
Bred by W. M. Smith, Scotland, Ont.
Test commenced, July 22, 1910.
Age at commencement of test, 4 years and 192 days.
Date of calving, July 22, 1910.
Date of previous calving, August 4, 1909.
Date of calving after test, October 7, 1911.
Average per cent of fat, 4.48; days in milk, 365.
Total production, milk, 11,385.95 lbs.; fat, 511.97 lbs.
Production required for registration—milk, 8,028 lbs.; fat, 289.2 lbs.

- No. 199. '**Scottie's Sarah**,' No. 21870.
Sire, '**Scottie**,' No. 19712.
Dam, '**Sarah 2nd**,' No. 13192.
Owned by John McKee, Norwich, Ont.
Bred by H. & J. McKee, Norwich, Ont.
Test commenced, March 6, 1911.
Age at commencement of test, 4 years and 112 days.
Date of calving, March 2, 1911.
Date of previous calving, December 25, 1909.
Date of calving after test, February 8, 1912.
Average per cent of fat, 3.7; days in milk, 280.
Total production, milk, 9,364.6 lbs.; fat, 348.04 lbs.
Production required for registration—milk, 7,808 lbs.; fat, 281.2 lbs.

- No. 200. '**Guy's Red Rose 2nd**,' No. 29792.
Sire, '**Toga's Heir of Nether Lea**,' No. 21501.
Dam, '**Guy's Red Rose**,' No. 29790.
Owned by A. H. Trimble & Sons, Red Deer, Alta.
Bred by F. J. Guy, Darlington, Ont.
Test commenced, December 1, 1910.
Age at commencement of test, 4 years and 4 days.

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Date of calving, November 28, 1910.
 Date of previous calving, January 29, 1910.
 Date of calving after test, January 23, 1912.
 Average per cent of fat, 4.52; days in milk, 355.
 Total production, milk, 9,043.8 lbs.; fat, 409.16 lbs.
 Production required for registration—milk, 7,511 lbs.; fat, 270.4 lbs.

No. 201. 'Rena,' No. 27709.

Sire, 'Reliance of Ste. Anne's,' No. 21804.
 Dam, 'Sally,' No. 19607.
 Owned by W. J. Carlyle, Chesterville, Ont.
 Bred by H. J. Whitteker & Sons, Williamsburg, Ont.
 Test commenced, April 21, 1911.
 Age at commencement of test, 4 years.
 Date of calving, April 21, 1911.
 Date of previous calving, April 16, 1910.
 Date of calving after test, February 26, 1912.
 Average per cent of fat, 3.8; days in milk, 270.
 Total production, milk, 8,711 lbs.; fat, 332.53 lbs.
 Production required for registration—milk, 7,500 lbs.; fat, 270 lbs.

No. 210. 'Kirsty of Ste. Anne's,' No. 25968

Sire, 'Howie's Fizzaway,' No. 16721.
 Dam, 'Kirsty Wallace of Auchenbrain,' No. 8301.
 Bred and owned by Macdonald College, Macdonald College, Que.
 Test commenced, February 8, 1911.
 Age at commencement of test, 4 years and 334 days.
 Date of calving, February 8, 1911.
 Date of previous calving, January 20, 1910.
 Date of calving after test, March 26, 1912.
 Average per cent of fat, 3.65; days in milk, 358.
 Total production, milk, 9,150.75 lbs.; fat, 334.43 lbs.
 Production required for registration—milk, 7,413 lbs.; fat, 303.2 lbs.

COWS THREE YEARS OLD AND UNDER FOUR.

No. 145. 'Flavia 2nd of Ottawa,' No. 22197.

Sire, 'Reliance of Woodroffe,' No. 18747.
 Dam, 'Flavia,' No. 16502.
 Bred and owned by the Director of Experimental Farms, Ottawa.
 Test commenced, November 1, 1909.
 Age at commencement of test, 3 years and 330 days.
 Date of calving, October 28, 1909.
 Date of previous calving, October 16, 1908.
 Date of calving after test, January 6, 1911.
 Average per cent of fat, 4.14; days in milk, 331.
 Total production, milk, 8,413.5 lbs.; fat, 348.53 lbs.
 Production required for registration—milk, 8,407.5 lbs.; fat, 303 lbs.

No. 148. 'Madge,' No. 27700.

Sire, 'Major,' No. 23467.
 Dam, 'Bonnie Doon,' No. 19437.
 Bred and owned by Wooddisse Bros., Rothsay, Ont.
 Test commenced, April 4, 1910.
 Age at commencement of test, 3 years and 110 days.
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Date of calving, April 3, 1910.
 Date of previous calving, February 16, 1909.
 Date of calving after test, May 15, 1911.
 Average per cent of fat, 4.58; days in milk, 320.
 Total production, milk, 7,271 lbs.; fat, 333.24 lbs.
 Production required for registration—milk, 6,802.5 lbs; fat, 245 lbs.

No. 163. '**Stony Croft Lady Helen**,' No. 25225.

Sire, '**Barcheskie May King**,' No. 5685.
 Dam, '**Old Graitney Trim 4th**,' No. 22702.
 Owned by Alex. Hume & Co., Menie, Ont.
 Bred by Andrew Mitchell, Barcheskie, Scotland.
 Test commenced, August 27, 1910.
 Age at commencement of test, 3 years and 340 days.
 Date of calving, August 26, 1910.
 Date of previous calving, August 16, 1909.
 Date of calving after test, August 26, 1911.
 Average per cent of fat, 4.17; days in milk, 302.
 Total production, milk, 8,602 lbs.; fat, 358.96 lbs.
 Production required for registration—milk, 7,435 lbs.; fat, 268 lbs.

No. 166. '**Flower of Sardis**,' No. 26539.

Sire, '**Royal Peter of Ste. Anne's**,' No. 13140.
 Dam, '**Woodroffe Dairymaid**,' No. 3437.
 Owned by Jos. Thompson, Sardis, B.C.
 Bred by Geo. E. Knight, Sardis, B.C.
 Test commenced, October 8, 1910.
 Age at commencement of test, 3 years and 32 days.
 Date of calving, October 8, 1910.
 Date of previous calving, July 20, 1909.
 Date of calving after test, October 7, 1911.
 Average per cent of fat, 3.66; days in milk, 323.
 Total production, milk, 6,760.25 lbs.; fat, 247.52 lbs.
 Production required for registration—milk, 6,538 lbs.; fat, 237 lbs.

No. 160. '**Dewdrop of Menie**,' No. 25875.

Sire, '**Rob Roy**,' No. 14584.
 Dam, '**Scotland's Best of Dentonia**,' No. 13672.
 Bred and owned by Wm. Stewart & Son, Menie, Ont.
 Test commenced, August 10, 1910.
 Age at commencement of test, 3 years and 10 days.
 Date of calving, August 10, 1910.
 Date of calving after test, July 15, 1911.
 Average per cent of fat, 4.10; days in milk, 295.
 Total production, milk, 9,783 lbs.; fat, 401.46 lbs.
 Production required for registration—milk, 6,527.5 lbs.; fat, 235 lbs.

No. 161. '**Lass O'Gowrie**,' No. 25190.

Sire, '**Rob Roy**,' No. 14584.
 Dam, '**Jessie Blair Stewart of Menie**,' No. 14549.
 Bred and owned by Wm. Stewart & Son, Menie, Ont.
 Test commenced, May 17, 1910.
 Age at commencement of test, 3 years and 24 days.
 Date of calving, May 15, 1910.
 Date of calving after test, May 7, 1911.
 Average per cent of fat, 4.04; days in milk, 333.

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Total production, milk, 6,896.5 lbs.; fat, 279.16 lbs.

Production required for registration—milk, 6,566 lbs.; fat, 236.4 lbs.

No. 174. 'Dairy Miss,' No. 24722.

Sire, 'Dainty Lad of Elmshade,' No. 2245.

Dam, 'Dairy Maid,' No. 24702.

Owned by Andrew McRae, East Royalty, P.E.I.

Bred by Wm. Miller, Marshfield, P.E.I.

Test commenced, September 25, 1910.

Age at commencement of test, 3 years and 222 days.

Date of calving, September 18, 1910.

Date of previous calving, September 26, 1909.

Date of calving after test, November 14, 1911.

Average per cent of fat, 4.17; days in milk, 365.

Total production, milk, 7,631 lbs.; fat, 318.21 lbs.

Production required for registration—milk, 7,100 lbs.; fat, 256.2 lbs.

No. 177. 'Coquette of Lakeside,' No. 26685.

Sire, 'Jock of Maple Hill,' No. 18660.

Dam, 'Garclaugh Enchantress,' No. 16761.

Bred and owned by G. H. Montgomery, Philipsburg, Que.

Test commenced, September 2, 1910.

Age at commencement of test, 3 years and 74 days.

Date of calving, September 1, 1910.

Date of previous calving, August 1909.

Date of calving after test, October 8, 1911.

Average per cent of fat, 3.97; days in milk, 350.

Total production, milk, 7,609.5 lbs.; fat, 303.18 lbs.

Production required for registration—milk, 6,703.5 lbs.; fat, 241.4 lbs.

No. 173. 'Barcheskie Derby 6th,' No. 28548.

Sire, 'McQuittiston Secretary,' No. 28679.

Dam, 'Derby 4th of Barcheskie,' No. 14382.

Owned by Geo. H. Montgomery, Philipsburg, Que.

Bred by And. Mitchell, Barcheskie, Scotland.

Test commenced, September 28, 1910.

Age at commencement of test, 3 years and 184 days.

Date of calving, September 24, 1910.

Date of calving after test, November 6, 1911.

Average per cent of fat, 4.10; days in milk, 337.

Total production, milk, 7,206 lbs.; fat, 296.22 lbs.

Production required for registration—milk, 7,006 lbs.; fat, 252.4 lbs.

No. 181. 'Grace,' No. 27602.

Sire, 'Nissouri Pride,' No. 23888.

Dam, 'Red Rose of Sunny Springs,' No. 15640.

Owned by A. S. Turner & Son, Ryckman's Corners, Ont.

Bred by D. A. James, Nilestown, Ont.

Test commenced, August 23, 1910.

Age at commencement of test, 3 years and 153 days.

Date of calving, August 22, 1910.

Date of calving after test, August 26, 1911.

Average per cent of fat, 3.9; days in milk, 302.

Total production, milk, 7,721.9 lbs.; fat, 301.85 lbs.

Production required for registration—milk, 6,920.75 lbs.; fat, 249.3 lbs

- No. 183. 'Scottie's Victoria,' No. 23675.
Sire, 'Scottie,' No. 19718.
Dam, 'Victoria,' No. 13788.
Owned by John McKee, Norwich, Ont.
Bred by H. & J. McKee, Norwich, Ont.
Test commenced, November 30, 1910.
Age at commencement of test, 3 years and 332 days.
Date of calving, November 26, 1910.
Date of previous calving, August 15, 1909.
Date of calving after test, December 20, 1911.
Average per cent of fat, 3.87; days in milk, 314.
Total production, milk, 10,057.5 lbs.; fat, 389.56 lbs.
Production required for registration—milk, 7,413 lbs.; fat, 267 lbs.
- No. 186. 'Scottie's Dandy 2nd,' No. 25690.
Sire, 'Scottie,' No. 19718.
Dam, 'Dandy 1st of Brookside,' No. 13786.
Owned by John McKee, Norwich, Ont.
Bred by H. & J. McKee, Norwich, Ont.
Test commenced, November 7, 1910.
Age at commencement of test, 3 years and 9 days.
Date of calving, November 3, 1910.
Date of calving after test, December 26, 1911.
Average per cent of fat, 3.96; days in milk, 293.
Total production, milk, 7,317.9 lbs.; fat, 289.78 lbs.
Production required for registration—milk, 6,524.75 lbs.; fat, 234.9 lbs.
- No. 189. 'Jemima of Springbank 2nd,' No. 29618.
Sire, 'Hamilton Chief,' No. 17491.
Dam, 'Jemima,' No. 27688.
Owned by A. S. Turner & Son, Ryckman's Corners, Ont.
Bred by A. S. Turner, Ryckman's Corners, Ont.
Test commenced, February 27, 1911.
Age at commencement of test, 3 years and 160 days.
Date of calving, February 27, 1911.
Date of calving after test, January 1, 1912.
Average per cent of fat, 3.77; days in milk, 243.
Total production, milk, 8,265.05 lbs.; fat, 311.99 lbs.
Production required for registration—milk, 6,940 lbs.; fat, 250 lbs.
- No. 194. 'College Merry Maid,' No. 28776.
Sire, 'Lessnessock Royal Monarch,' No. 24424.
Dam, 'Triple X of Dentonia,' No. 18822.
Owned by Nova Scotia Agricultural College, Truro, N.S.
Bred by Alex. Hume & Co., Menie, Ont.
Test commenced, November 1, 1910.
Age at commencement of test, 3 years and 47 days.
Date of calving, November 1, 1910.
Date of previous calving, November 28, 1909.
Date of calving after test, January 15, 1912.
Average per cent of fat, 3.08; days in milk, 365.
Total production, milk, 8,371.75 lbs.; fat, 321.62 lbs.
Production required for registration—milk, 6,629.2 lbs.; fat, 234.5 lbs.
- No. 197. 'Lady Minto 2nd,' No. 24159.
Sire, 'Reliance of Ste. Anne's,' No. 21800.
Dam, 'Lady Minto,' No. 10134.

SESSIONAL PAPER No. 15b

Owned by W. J. Carlyle, Chesterville, Ont.
 Bred by H. J. Whitteker & Sons, Williamsburg, Ont.
 Test commenced, February 7, 1911.
 Age at commencement of test, 3 years and 313 days.
 Date of calving, February 3, 1911.
 Date of calving after test, January 27, 1912.
 Average per cent of fat, 4.16; days in milk, 390.
 Total production, milk, 7,716.6 lbs.; fat, 321.01 lbs.
 Production required for registration—milk, 7,360.75 lbs.; fat, 265.3 lbs.

No. 198. 'Oddity,' No. 27699.

Sire, 'Miller o'the Dee,' No. 10422.
 Dam, 'Little Queen 3rd,' No. 13570.
 Bred and owned by Wooddisse Bros., Rothsay, Ont.
 Test commenced, November 19, 1910.
 Age at commencement of test, 3 years and 141 days.
 Date of calving, November 17, 1910.
 Date of previous calving, August 17, 1909.
 Date of calving after test, January 18, 1912.
 Average per cent of fat, 4.24; days in milk, 365.
 Total production, milk, 9,030.25 lbs.; fat, 383.62 lbs.
 Production required for registration—milk, 6,887.75 lbs.; fat, 248.4 lbs.

No. 204. 'Mabel of Riverside,' No. 26320.

Sire, 'Barcheskie Raymond,' No. 21358.
 Dam, 'Lady Basham,' No. 6406.
 Owned by G. D. Mode, Vankleek Hill, Ont.
 Bred by Jas. Cottingham, Ormstown, Que.
 Test commenced, October 12, 1910.
 Age at commencement of test, 3 years and 154 days.
 Date of calving, October 12, 1910.
 Date of calving after test, December 9, 1911.
 Average per cent of fat, 3.98; days in milk, 365.
 Total production, milk, 9,432 lbs.; fat, 375.54 lbs.
 Production required for registration—milk, 6,923.5 lbs.; fat, 249.4 lbs.

COWS TWO YEARS OLD AND UNDER THREE.

No. 142. 'Annie Laurie 3rd,' No. 27957.

Sire, 'Scottie,' No. 19718. R. of P. No. 5.
 Dam, 'Annie Laurie 2nd,' No. 15588. R. of P. No. 83.
 Owned by W. W. Ballantyne, Stratford, Ont.
 Bred by H. & J. McKee, Norwich, Ont.
 Test commenced, March 20, 1910.
 Age at commencement of test, 2 years and 135 days.
 Date of calving, March 17, 1910.
 Date of calving after test, April 23, 1911.
 Average per cent of fat, 3.68; days in milk, 365.
 Total production, milk, 7,728.6 lbs.; fat, 284.93 lbs.
 Production required for registration—milk, 5,871.25 lbs.; fat, 211.5 lbs.

No. 144. 'Scottie's White Wings,' No. 24266.

Sire, 'Scottie,' No. 19718. R. of P. No. 5.
 Dam, 'White Wings,' No. 9304.
 Bred and owned by H. & J. McKee, Norwich, Ont.

Test commenced, March 14th, 1910.

Age at commencement of test, 2 years and 338 days.

Date of calving, March 10, 1910.

Date of calving after test, April 27, 1911.

Average per cent of fat, 3.56; days in milk, 328.

Total production, milk, 6,933.7 lbs.; fat, 247.38 lbs.

Production required for registration—milk, 6,430 lbs.; fat, 231 lbs.

No. 146. '**Ottawa Kate**,' No. 29601.

Sire, '**Admiral Togo**,' No. 28201.

Dam, '**Yellow Kate 1st of Auchenbrain**,' No. 14343.

Bred and owned by the Director of Experimental Farms, Ottawa.

Test commenced, October 5, 1909.

Age at commencement of test, 2 years and 307 days.

Date of calving, October 4, 1909.

Date of calving after test, December 23, 1910.

Average per cent of fat, 3.76; days in milk, 365.

Total production, milk, 9,017 lbs.; fat, 339.45 lbs.

Production required for registration—milk, 6,344 lbs.; fat, 228 lbs.

No. 157. '**Holehouse Flirt of Trout Run**,' No. 27033.

Sire, '**Holehouse Pilot**,' No. 22596.

Dam, '**Polly**,' No. 2637.

Bred and owned by Wm. Thorn, Lynedock, Ont.

Test commenced, May 4, 1910.

Age at commencement of test, 2 years and 262 days.

Date of calving, May 4, 1910.

Date of calving after test, July 12, 1911.

Average per cent of fat, 4.21; days in milk, 365.

Total production, milk, 10,298.5 lbs.; fat, 433.72 lbs.

Production required for registration—milk, 6,220.5 lbs.; fat, 224.2 lbs.

No. 158. '**Lessnessock Sprightly**,' No. 26345.

Sire, '**Dalfibble Stylish Boy**,' No. 6295.

Dam, '**Dalfibble Sprightly 2nd**,' No. 15867.

Owned by Alex. Hume & Co., Menie, Ont.

Bred by John Mackie, Dumfries, Scotland.

Test commenced, August 15, 1910.

Age at commencement of test, 2 years and 209 days.

Date of calving, August 12, 1910.

Date of calving after test, August 2, 1911.

Average per cent of fat, 3.51; days in milk, 322.

Total production, milk, 7,405 lbs.; fat, 260.35 lbs.

Production required for registration—milk, 6,074.75 lbs.; fat, 218.9 lbs.

No. 162. '**Milkmaid 7th**,' No. 28769.

Sire, '**Dainty Lad of Elm Shade**,' No. 2245.

Dam, '**Milkmaid 4th**,' No. 12374.

Owned by Andrew McRae, East Royalty, P.E.I.

Bred by Wm. Miller, Marshfield, P.E.I.

Test commenced, August 3, 1910.

Age at commencement of test, 2 years and 344 days.

Date of calving, July 26, 1910.

Date of calving after test, September 17, 1911.

Average per cent of fat, 4.22; days in milk, 365.

Total production, milk, 11,673.5 lbs.; fat, 492.75 lbs.

Production required for registration—milk, 6,446 lbs.; fat, 232.4 lbs.

SESSIONAL PAPER No. 15b

No. 165. 'Long Legget Kirsty,' No. 26541.

Sire, 'Rob Roy,' No. 14584.

Dam, 'Brownie of Menie,' No. 11632.

Bred and owned by Wm. Stewart & Son, Menie, Ont.

Test commenced, June 1, 1910.

Age at commencement of test, 2 years and 10 days.

Date of calving, June 1, 1910.

Date of calving after test, May 3, 1911.

Average per cent of fat, 4.16; days in milk, 345.

Total production, milk, 6,602 lbs.; fat, 265.18 lbs.

Production required for registration—milk, 5,527.5 lbs.; fat, 199 lbs.

No. 167. 'Fairview Lassie,' No. 26531.

Sire, 'Bessie's Mangus,' No. 23833.

Dam, 'Fairy Lass,' No. 21829.

Bred and owned by Jos. Thompson, Sardis, B.C.

Test commenced, September 12, 1910.

Age at commencement of test, 2 years and 176 days.

Date of calving, September 9, 1910.

Date of calving after test, September 30, 1911.

Average per cent of fat, 3.65; days in milk, 353.

Total production, milk, 10,464 lbs.; fat, 381.74 lbs.

Production required for registration—milk, 5,989.5 lbs.; fat, 215.8 lbs.

No. 168. 'Fairview Nora,' No. 26532.

Sire, 'Bessie's Mangus,' No. 23833.

Dam, 'Glenora Stately,' No. 11425.

Bred and owned by Jos. Thompson, Sardis, B.C.

Test commenced, September 13, 1910.

Age at commencement of test, 2 years and 156 days.

Date of calving, September 11, 1910.

Date of calving after test, September 29, 1911.

Average per cent of fat, 3.95; days in milk, 313.

Total production, milk, 6,972.5 lbs.; fat, 275.91 lbs.

Production required for registration—milk, 5,929 lbs.; fat, 213.6 lbs.

No. 169. 'New Year,' No. 29577.

Sire, 'Ivanhoe of Springhill,' No. 19596.

Dam, 'Daisy,' No. 23582.

Bred and owned by Wooddisse Bros., Rothsay, Ont.

Test commenced, July 7, 1910.

Age at commencement of test, 2 years and 188 days.

Date of calving, July 7, 1910.

Date of calving after test, August 24, 1911.

Average per cent of fat, 4.7; days in milk, 365.

Total production, milk, 7,445.5 lbs.; fat, 350.10 lbs.

Production required for registration—milk, 6,017 lbs.; fat, 216.8 lbs.

No. 170. 'Nola of Craigielea,' No. 29803.

Sire, 'Aberdeen,' No. 16917.

Dam, 'Nola of Ingleside,' No. 20477.

Bred and owned by H. C. Hamill, Box Grove, Ont.

Test commenced, August 14, 1910.

Age at commencement of test, 2 years and 176 days.

Date of calving, August 12, 1910.

Date of calving after test, October 2, 1911.

Average per cent of fat, 4.05; days in milk, 337.
Total production, milk, 6,092.25 lbs.; fat, 247.20 lbs.
Production required for registration—milk, 5,984 lbs.; fat, 216.6 lbs.

No. 175. 'Mollie Bawn,' No. 28376.

Sire, 'Belevidere Prince,' No. 26166.

Dam, 'Lily Queen,' No. 28373.

Owned by And. McRae & Sons, East Royalty, P.E.I.

Bred by Provincial Farm, Charlottetown, P.E.I.

Test commenced, September 28, 1910.

Age at commencement of test, 2 years and 100 days.

Date of calving, September 27, 1910.

Date of calving after test, November 4, 1911.

Average per cent of fat, 4.00; days in milk, 365.

Total production, milk, 5,919.75 lbs.; fat, 236.30 lbs.

Production required for registration—milk, 5,775 lbs.; fat, 208 lbs.

No. 179. 'Ayrshire Beauty of Trout Run,' No. 27034.

Sire, 'Holehouse Pilot,' No. 22596.

Dam, 'Empress Augusta of Trout Run,' No. 19849.

Bred and owned by Wm. Thorn, Lynedock, Ont.

Test commenced, July 4, 1910.

Age at commencement of test, 2 years and 50 days.

Date of calving, July 3, 1910.

Date of calving after test, September 15, 1911.

Average per cent of fat, 3.91; days in milk, 365.

Total production, milk, 8,008.45 lbs.; fat, 313.24 lbs.

Production required for registration—milk, 5,637.5 lbs.; fat, 203 lbs.

No. 184. 'Burnside Pearl 4th,' No. 27151.

Sire, 'Barcheskie King's Own,' No. 20726.

Dam, 'Lady Pearl of Burnside,' No. 13467. R. of P. No. 17.

Bred and owned by R. R. Ness, Howick, Que.

Test commenced, October 8, 1910.

Age at commencement of test, 2 years and 300 days.

Date of calving, October 6, 1910.

Date of calving after test, August 30, 1911.

Average per cent of fat, 3.93; days in milk, 292.

Total production, milk, 6,471 lbs.; fat, 254.419 lbs.

Production required for registration—milk, 6,325 lbs.; fat, 228 lbs.

No. 185. 'Burnside Silver Bell,' No. 34664.

Sire, 'Bargeoch Baron Winter,' No. 71682.

Dam, 'Bargenoch Silver Bell,' No. 30852.

Owned by R. R. Ness, Howick, Que.

Bred by M. Logan, Drongan, Scotland.

Test commenced, October 13, 1910.

Age at commencement of test, 2 years and 282 days.

Date of calving, October 11, 1910.

Date of calving after test, October 2, 1911.

Average per cent of fat, 4.04; days in milk, 287.

Total production, milk, 6,487.75 lbs.; fat, 262.62 lbs.

Production required for registration—milk, 6,275 lbs.; fat, 226.2 lbs.

No. 188. 'Helena of Springbank,' No. 30215.

Sire, 'Burnside Heather King,' No. 23653.

Dam, 'Helena,' No. 3356.

SESSIONAL PAPER No. 15b

Owned by A. S. Turner & Son, Ryckman's Corners, Ont.

Bred by Jas. McCormick, Rockton, Ont.

Test commenced, February 14, 1911.

Age at commencement of test, 2 years and 302 days.

Date of calving, February 14, 1911.

Date of calving after test, January 6, 1912.

Average per cent of fat, 4.11; days in milk, 289.

Total production, milk, 6,764.55 lbs.; fat, 278.01 lbs.

Production required for registration—milk, 6,330.5 lbs.; fat, 228.2 lbs.

No. 191. '**Lessnessock Queen Bee**,' No. 30581.

Sire, '**Barrowmoss Swell**,' No. 6408.

Dam, '**Hillhouse Queen Bee 4th**,' No. 17598.

Owned by Robt. Hunter & Sons, Maxville, Ont.

Bred by Robt. McKinlay, Hillhouse, Scotland.

Test commenced, September 1, 1910.

Age at commencement of test, 2 years and 168 days.

Date of calving, August 28, 1910.

Date of calving after test, August 25, 1911.

Average per cent of fat, 3.94; days in milk, 303.

Total production, milk, 6,163 lbs.; fat, 243.44 lbs.

Production required for registration—milk, 5,962 lbs.; fat, 214.8 lbs.

No. 192. '**Scottie's Victoria 2nd**,' No. 25906.

Sire, '**Scottie**,' No. 19718. R. of P. No. 5.

Dam, '**Victoria**,' No. 13788.

Owned by John McKee, Norwich, Ont.

Bred by H. & J. McKee, Norwich, Ont.

Test commenced, October 22, 1910.

Age at commencement of test, 2 years and 341 days.

Date of calving, October 18, 1910.

Date of calving after test, January 13, 1912.

Average per cent of fat, 3.86; days in milk, 365.

Total production, milk, 8,359.9 lbs.; fat, 322.82 lbs.

Production required for registration—milk, 6,437.75 lbs.; fat, 232 lbs.

No. 193. '**Ravensdale Flirt**,' No. 26652.

Sire, '**Bright Star of Glenora**,' No. 16293.

Dam, '**Isaleigh Flora**,' No. 16198.

Bred and owned by W. F. Kay, Philipsburg, Que.

Test commenced, December 19, 1910.

Age at commencement of test, 2 years and 264 days.

Date of calving, December 15, 1910.

Date of calving after test, December 28, 1911.

Average per cent of fat, 3.859; days in milk, 317.

Total production, milk, 6,672 lbs.; fat, 257.47 lbs.

Production required for registration—milk, 6,226 lbs.; fat, 224.4 lbs.

No. 196. '**Christmas Belle**,' No. 25958.

Sire, '**Royal Peter of Neidpath**,' No. 16138.

Dam, '**Adalia 2nd**,' No. 22949.

Bred and owned by E. Cohoon, Harrietsville, Ont.

Test commenced, June 26, 1909.

Age at commencement of test, 2 years and 180 days.

Date of calving, June 26, 1909.

Date of calving after test, July 9, 1910.

3 GEORGE V., A. 1913

Average per cent of fat, 3.46; days in milk, 330.
Total production, milk, 7,684.9 lbs.; fat, 265.67 lbs.
Production required for registration—milk, 5,995 lbs.; fat, 216 lbs.

No. 203. **'Scottie's Nancy 2nd,'** No. 27253.

Sire, **'Scottie,'** No. 19718. R. of P. No. 5.

Dam, **'Nancy 2nd,'** No. 19780.

Owned by John McKee, Norwich, Ont.

Bred by H. & J. McKee, Norwich, Ont.

Test commenced, February 4, 1911.

Age at commencement of test, 2 years and 310 days.

Date of calving, January 31, 1911.

Date of calving after test, March 5, 1912.

Average per cent of fat, 4.10; days in milk, 295.

Total production, milk, 8,387.4 lbs.; fat, 343.56 lbs.

Production required for registration—milk, 6,352.5 lbs.; fat, 229 lbs.

No. 208. **'Briery 2nd of Springbank,'** No. 32137.

Sire, **'St. Peter,'** No. 23366.

Dam, **'Briery of Springbank,'** No. 29616.

Bred and owned by A. S. Turner & Son, Ryckman's Corners, Ont.

Test commenced, January 1, 1911.

Age at commencement of test, 2 years and 198 days.

Date of calving, January 1, 1911.

Date of calving after test, March 7, 1912.

Average per cent of fat, 3.68; days in milk, 365.

Total production, milk, 14,131.35 lbs.; fat, 520.49 lbs.

Production required for registration—milk, 6,044.5 lbs.; fat, 217.8 lbs.

No. 209. **'Butter Maid of Craiglea,'** No. 29940.

Sire, **'Woodroffe Comrade,'** No. 23029.

Dam, **'Peach of Ingleside,'** No. 24330.

Owned by A. S. Turner & Son, Ryckman's Corners, Ont.

Bred by H. C. Hamill, Box Grove, Ont.

Test commenced, January 9, 1911.

Age at commencement of test, 2 years and 174 days.

Date of calving, January 8, 1911.

Date of calving after test, March 7, 1912.

Average per cent of fat, 4.21; days in milk, 365.

Total production, milk, 11,392.45 lbs.; fat, 480.33 lbs.

Production required for registration—milk, 5,978.5 lbs.; fat, 215.4 lbs.

No. 213. **'Queen of Meadowvale,'** No. 26982.

Sire, **'First Choice of Springvale,'** No. 14318.

Dam, **'Lady of Elm View,'** No. 20976.

Owned by N. S. Agricultural College, Truro, N.S.

Bred by Sam'l. A. Porter, Deerfield, N.S.

Test commenced, January 1, 1911.

Age at commencement of test, 2 years and 122 days.

Date of calving, December 17, 1910.

Date of calving after test, March 16, 1912.

Average per cent of fat, 3.84; days in milk, 362.

Total production, milk, 6,176.75 lbs.; fat, 237.55 lbs.

Production required for registration—milk, 5,835.5 lbs.; fat, 210.2 lbs.

FRENCH CANADIAN.

COWS TWO YEARS OLD AND UNDER THREE.

- No. 15. 'Winnie,' No. 1844.
Sire, 'Nonpareil,' No. 1230.
Dam, 'Lyster I,' No. 1242.
Bred and owned by C. N. Lyster, Kirkdale, Que.
Test commenced, November 1, 1910.
Age at commencement of test, 2 years and 10 days.
Date of calving, October 31, 1910.
Date of calving after test, January 1, 1912.
Average per cent of fat, 4.67; days in milk, 365.
Total production, milk, 5,293.81 lbs.; fat, 247.63 lbs.
Production required for registration—milk, 4,422 lbs.; fat, 199 lbs.
- No. 16. 'Jane,' No. 1843.
Sire, 'Nonpareil,' No. 1230.
Dam, 'Lyster II,' No. 1235.
Bred and owned by C. N. Lyster, Kirkdale, Que.
Test commenced, December 21, 1910.
Age at commencement of test, 2 years and 64 days.
Date of calving, December 21, 1910.
Date of calving after test, February 14, 1912.
Average per cent of fat, 4.62; days in milk, 365.
Total production, milk, 4,977.69 lbs.; fat, 230.26 lbs.
Production required for registration—milk, 4,540.8 lbs.; fat, 204.4 lbs.

GUERNSEY.

COWS TWO YEARS OLD AND UNDER THREE.

- No. 6. 'Dona Clatina,' No. 172.
Sire, 'Ottawa's Beautiful Masher,' No. 10050. A.G.C.C.
Dam, 'Queen Clatina,' No. 16414. A.G.C.C.
Bred and owned by the Director of Experimental Farms, Ottawa.
Test commenced, September 6, 1909.
Age at commencement of test, 2 years and 245 days.
Date of calving, September 5, 1909.
Date of calving after test, September 14, 1910.
Average per cent of fat, 5.47; days in milk, 360.
Total production, milk, 6,096.5 lbs.; fat, 333.53 lbs.
Production required for registration—milk, 5,674 lbs.; fat, 227 lbs.
- No. 7. 'Dairy Queen of Hillside,' No. 123.
Sire, 'Pilate of Hillside,' No. 62.
Dam, 'Colombine of Eastview,' No. 17994. A.G.C.C.
Bred and owned by Howard W. Corning, Chegoggin, N.S.

3 GEORGE V., A. 1913

Test commenced, April 17, 1910.
Age at commencement of test, 2 years and 74 days.
Date of calving, April 15, 1910.
Date of calving after test, April 20, 1911.
Average per cent of fat, 5.34; days in milk, 319.
Total production, milk, 5,447 lbs.; fat, 291.15 lbs.
Production required for registration—milk, 5,203 lbs.; fat, 208 lbs.

HOLSTEIN FRIESIAN.

COWS FIVE YEARS OLD AND OVER.

Production required for registration: milk, 10,500 lbs.; fat, 357 lbs.

- No. 158. 'Aaggie DeKol Witzyde,' No. 6440.
Sire, 'DeKol Artis Witzyde,' No. 1602.
Dam, 'Netherland Aaggie,' No. 2478.
Owned by J. M. VanPatter, Aylmer, Ont., R.F.D. No. 1.
Bred by J. M. Van Patter, Aylmer, Ont., R.L.D. No. 1.
Test commenced, January 31, 1910.
Age at commencement of test, 6 years.
Date of calving, January 30, 1910.
Date of previous calving, March 1, 1909.
Date of calving after test, April 3, 1911.
Average per cent of fat, 3.25; days in milk, 335.
Total production, milk, 13,709.75 lbs.; fat, 446.79 lbs.
- No. 166. 'Patsy 4th's Axie DeKol,' No. 9739.
Sire, 'Axie's Prince Pietertje DeKol,' No. 2548.
Dam, 'Patsy 4th,' No. 3407.
Owned by Thos. Hartley, Downsview, Ont.
Bred by R. S. Stevenson, Ancaster, Ont.
Test commenced, February 9, 1910.
Age at commencement of test, 6 years.
Date of calving, February 9, 1910.
Date of previous calving, December 7, 1908.
Date of calving after test, April 12, 1911.
Average per cent of fat, 3.37; days in milk, 315.
Total production, milk, 13,446.56 lbs.; fat, 453.33 lbs.
- No. 172. 'Amy Peep 3rd,' No. 5513.
Sire, 'Waldorf DeKol Hengerveld,' No. 20300. H.F.H.B.
Dam, 'Amy Peep,' No. 41740. H.F.H.B.
Owned by J. W. McCormick, Morewood Ont.
Bred by estate of Henry Wisler, Columbia, Penn., U.S.A.
Test commenced, March 18, 1910.
Age at commencement of test, 7 years.
Date of calving, March 17, 1910.
Date of previous calving, April 6, 1909.
Date of calving after test, April 21, 1911.
Average per cent of fat, 3.46; days in milk, 365.
Total production, milk, 13,607.05 lbs.; fat, 471.89 lbs.

SESSIONAL PAPER No. 15b

No. 174. 'Georgie,' No. 5742.

Sire, 'Sir Mantel Mechthilde,' No. 3604.

Dam, 'Aliene DeKol,' No. 3776.

Bred and owned by J. B. Arnold, Easton's Corners, Ont.

Test commenced, March, 12, 1910.

Age at commencement of test, 5 years.

Date of calving, March 10, 1910.

Date of previous calving, February 15, 1909.

Date of calving after test, May 8, 1911.

Average per cent of fat, 3.21; days in milk, 341.

Total production, milk, 12,299.27 lbs.; fat, 393.74 lbs.

No. 175. 'May DeKol,' No. 4343.

Sire, 'Paul Edna DeKol,' No. 1795.

Dam, 'Witzde Queen,' No. 2011.

Owned by J. B. Arnold, Easton's Corners, Ont.

Bred by C. Hawks, Smith's Falls, Ont.

Test commenced, March 11, 1910.

Age at commencement of test, 7 years.

Date of calving, March 7, 1910.

Date of previous calving, March 5, 1909.

Date of calving after test, June 2, 1911.

Average per cent of fat, 3.28; days in milk, 363.

Total production, milk, 13,588.05 lbs.; fat, 445.66 lbs.

No. 176. 'Rooker's Jongste Tensen,' No. 4075.

Sire, 'Lady Tensen's Sir Rooker,' No. 1538.

Dam, 'Jongste Aagje's Tirania Daisy of Minster,' No. 2476.

Bred and owned by R. Honey, Brickley, Ont.

Test commenced, March 27, 1910.

Age at commencement of test, 8 years.

Date of calving, March 26, 1910.

Date of previous calving, April 16, 1909.

Date of calving after test, May 19, 1911.

Average per cent of fat, 3.19; days in milk, 365.

Total production, milk, 12,950.25 lbs.; fat, 414.042 lbs.

No. 180. 'Hengerveld Docia,' No. 5512.

Sire, 'Brookside Hengerveld Paul,' No. 26029. H.F.H.B.

Dam, 'Annie Clothilde Docia 2nd,' No. 43059. H.F.H.B.

Owned by J. W. McCormick, Morewood, Ont.

Bred by estate of Henry Wisler, Columbia, Penn., U.S.A.

Test commenced, June 4, 1910.

Age at commencement of test, 7 years.

Date of calving, June 4, 1910.

Date of previous calving, June 20, 1909.

Date of calving after test, June 4, 1911.

Average per cent of fat, 3.72; days in milk, 330.

Total production, milk, 10,708.56 lbs.; fat, 397.52 lbs.

No. 186. 'Mercedes Jewel,' No. 6219.

Sire, 'Count Cornelius,' No. 3144.

Dam, 'Homestead Mercena,' No. 4678.

Owned by Monro & Lawless, Thorold, Ont.

Bred by J. W. Cohoe, New Durham, Ont.

Test commenced, May 17, 1910.

3 GEORGE V., A. 1913

Age at commencement of test, 5 years.
 Date of calving, May 16, 1910.
 Date of previous calving, April 16, 1909.
 Date of calving after test, June 25, 1911.
 Average per cent of fat, 3.25; days in milk, 287.
 Total production, milk, 11,751.4 lbs; fat, 382.79 lbs.

No. 188. '**Rose of Alnwick**,' No. 4435.
 Sire, '**Lady Tensen's Sir Rooker**,' No. 1538.
 Dam, '**Rice Lake Belle**,' No. 1907.
 Owned by J. S. Honey, Cherrywood, Ont.
 Bred by Robt. Campbell, Roseneath, Ont.
 Test commenced, April 1, 1910.
 Age at commencement of test, 9 years.
 Date of calving, March 25, 1910.
 Date of previous calving, February 12, 1909.
 Date of calving after test, June 12, 1911.
 Average per cent of fat, 3.16; days in milk, 365.
 Total production, milk, 12,639.6 lbs.; fat, 399.8 lbs.

No. 189. '**Helena Pieterje's Pauline**,' No. 4374.
 Sire, '**Panarista Pauline's DeKol King**,' No. 2104.
 Dam, '**Helena Pietertje**,' No. 2922.
 Owned by S. J. Foster, Bloomfield, Ont.
 Bred by A. D. Foster, Holloway, Ont.
 Test commenced, March 1, 1910.
 Age at commencement of test, 7 years.
 Date of calving, February 26, 1910.
 Date of previous calving, March 20, 1909.
 Date of calving after test, April 9, 1911.
 Average per cent of fat 3.04; days in milk, 337.
 Total production, milk, 17,555.62 lbs.; fat, 534.489 lbs.

No. 191. '**Sadie Queen**,' No. 4390.
 Sire, '**Korndyke Queen's Butter Boy**,' No. 1666.
 Dam, '**Flora Grace Mechthilde**,' No. 3895.
 Owned by S. J. Foster, Bloomfield, Ont.
 Bred by G. W. Countryman, Tweed, Ont.
 Test commenced May 15, 1910.
 Age at commencement of test, 7 years.
 Date of calving, May 12, 1910.
 Date of previous calving, July 10, 1909.
 Date of calving after test, May 3, 1911.
 Average per cent of fat, 3.27; days in milk, 322.
 Total production, milk, 13,395.25 lbs.; fat, 439.107 lbs.

No. 196. '**Jean F. DeKol**,' No. 5480.
 Sire, '**Charley**,' No. 2127.
 Dam, '**Fredesrinda**,' No. 2706.
 Owned by S. G. Carlyle, Chesterville, Ont.
 Bred by Jos. Reid, Reid's Mills, Ont.
 Test commenced, August 4, 1910.
 Age at commencement of test, 6 years.
 Date of calving, August 3, 1910.
 Date of previous calving, July 13, 1910.

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Date of calving after test, August 2, 1911.
Average per cent of fat, 3.34; days in milk, 362.
Total production, milk, 15,654.6 lbs.; fat, 523.646 lbs.

- No. 198. 'Kate Castleton,' No. 4512.
Sire, 'Sir Pledge DeKol,' No. 1295.
Dam, 'Kate Claxton,' No. 1100.
Owned by F. S. Passmore, Brantford, Ont. (Box 241).
Bred by Ontario Agricultural College, Guelph, Ont.
Test commenced, September 21, 1910.
Age at commencement of test, 7 years.
Date of calving, September 19, 1910.
Date of previous calving, August 4, 1909.
Date of calving after test, October 31, 1911.
Average per cent of fat, 3.10; days in milk, 365.
Total production, milk, 18,713.5 lbs.; fat, 580.586 lbs.

- No. 203. 'May Echo,' No. 3372.
Sire, 'Count Echo DeKol,' No. 1465.
Dam, 'Rosa May,' No. 2235.
Owned by F. R. Mallory, Frankford, Ont.
Bred by B. Mallory, Frankford, Ont.
Test commenced, March 21, 1910.
Age at commencement of test, 9 years and 101 days.
Date of calving, March 20, 1910.
Date of previous calving, February 2, 1909.
Date of calving after test, May 9, 1911.
Average per cent of fat, 3.51; days in milk, 365.
Total production, milk, 23,707 lbs; fat, 833.645 lbs.

- No. 209. 'Pauline Aaggie DeKol II,' No. 5889.
Sire, 'Sir Pietertje Posch's Son,' No. 2949.
Dam, 'Pauline Aaggie DeKol,' No. 3688.
Bred and owned by J. W. McCormick, Morewood, Ont.
Test commenced, February 20, 1911.
Age at commencement of test, 5 years.
Date of calving, February 20, 1911.
Date of previous calving, April 6, 1910.
Date of calving after test, February 23, 1912.
Average per cent of fat, 3.7; days in milk, 357.
Total production, milk, 11,647.43 lbs.; fat, 436.8 lbs.

- No. 215. 'Alice Neilson,' No. 4222.
Sire, 'Count Mink Mercedes,' No. 221.
Dam, 'Kaatje De Boer 3rd,' No. 1822.
Owned by S. Lemon, Lynden, Ont.
Bred by G. W. Clemons, St. George, Ont.
Test commenced, November 11, 1910.
Age at commencement of test, 8 years.
Date of calving, November 6, 1910.
Date of previous calving, September 28, 1909.
Date of calving following test, November 8, 1911.
Average per cent of fat, 3.37; days in milk, 300.
Total production, milk 10,731.18 lbs.; fat, 361.17 lbs.

- No. 216. 'Sevangeline 2nd,' No. 4340.
Sire, 'Judge Patrick DeKol,' No. 1862.
Dam, 'Sevangeline,' No. 1996.
Owned by S. Lemon, Lynden, Ont.
Bred by Alfred Rice, Curries, Ont.
Test commenced, December 29, 1910.
Age of commencement of test, 8 years.
Date of calving, December 27, 1910.
Date of previous calving, December 29, 1909.
Date of calving after test, January 12, 1912.
Average per cent of fat, 3.8; days in milk, 313.
Total production, milk, 11,362.7 lbs.; fat, 436.59 lbs.

COWS FOUR YEARS OLD AND UNDER FIVE.

- No. 162. 'Irene Fairmont,' No. 6858.
Sire, 'Fairmont Albino Paul,' No. 2588.
Dam, 'Isabella,' No. 1990.
Owned by F. I. Burrill, Holbrook, Ont.
Bred by Edward Hughes, Zenda, Ont.
Test commenced, March 30, 1910.
Age at commencement of test, 4 years and 176 days.
Date of calving, March 28, 1910.
Date of previous calving, April 18, 1909.
Date of calving after test, May 25, 1911.
Average per cent of fat, 3.07; days in milk, 335.
Total production, milk, 13,690.36 lbs.; fat, 420.56 lbs.
Production required for registration—milk, 9,984 lbs.; fat, 340 lbs.
- No. 165. 'Bess DeKol,' No. 6738.
Sire, 'Sir Schuiling DeKol,' No. 3073.
Dam, 'Black Bess,' No. 4178.
Owned by John C. Brown, Stamford, Ont.
Bred by M. Hartley, Norwich, Ont.
Test commenced, March 22, 1910.
Age at commencement of test, 4 years and 350 days.
Date of calving, March 18, 1910.
Date of previous calving, January 29, 1909.
Date of calving after test, March 27, 1911.
Average per cent of fat, 3.08; days in milk, 265.
Total production, milk, 14,101.75 lbs.; fat, 435.37 lbs.
Production required for registration—milk, 10,462.5 lbs.; fat, 355.55 lbs.
- No. 183. 'Julia Posch Abbekerk,' No. 7911.
Sire, 'Sir Schuiling DeKol,' No. 3073.
Dam, 'Julia Abbekerk Posch 3rd,' No. 4983.
Owned by Monro & Lawless, Thorold, Ont.
Bred by W. A. Hartley, New Durham, Ont.
Test commenced, May 18, 1910.
Age at commencement of test, 4 years and 36 days.
Date of calving, May 17, 1910.
Date of previous calving, June 2, 1909.
Date of calving after test, June 18, 1911.
Average per cent of fat, 3.35; days in milk, 323.
Total production, milk, 11,241.2 lbs.; fat, 377.09 lbs.
Production required for registration—milk, 9,599 lbs.; fat, 356.5 lbs.

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- No. 185. '**Agatha Houwtje DeKol**,' No. 7968.
 Sire, '**Sir Houwtje B. Pietertje**,' No. 4814.
 Dam, '**Sylvan Agatha**,' No. 5104.
 Owned by Monro & Lawless, Thorold, Ont.
 Bred by H. E. George, Crampton, Ont.
 Test commenced, June 22, 1910.
 Age at commencement of test, 4 years and 25 days.
 Date of calving, June 20, 1910.
 Date of previous calving, June 14, 1909.
 Date of calving after test, July 20, 1911.
 Average per cent of fat, 3.23; days in milk, 365.
 Total production, milk, 12,576.8 lbs.; fat, 406.61 lbs.
 Production required for registration—milk, 9,588.75 lbs.; fat, 325.3 lbs.
- No. 190. '**Daisy Pauline Pietertje**,' No. 7042.
 Sire, '**Rosa Bell Victor**,' No. 2897.
 Dam, '**Helena Pietertje's Pauline**,' No. 4374.
 Owned by S. J. Foster, Bloomfield, Ont.
 Bred by B. E. Hagerman, Minto, Ont.
 Test commenced, April 1, 1910.
 Age at commencement of test, 4 years and 31 days.
 Date of calving, March 30, 1910.
 Date of previous calving, April 1, 1909.
 Date of calving following test, March 31, 1911.
 Average per cent of fat, 3.19; days in milk, 306.
 Total production, milk, 15,158.62 lbs.; fat, 494.80 lbs.
 Production required for registration—milk, 9,585.25 lbs.; fat, 325.88 lbs.
- No. 200. '**Nellie's Pet**,' No. 7489.
 Sire, '**Prince Pauline DeKol 10th**,' No. 3072.
 Dam, '**Charming Nellie**,' No. 4772.
 Owned by Tig. Wood, Mitchell, Ont.
 Bred by Elias Pannabecker, Hespeler, Ont.
 Test commenced, January 2, 1911.
 Age at commencement of test, 4 years and 170 days.
 Date of calving, January 2, 1911.
 Date of previous calving, January 3, 1910.
 Date of calving after test, December 3, 1911.
 Average per cent of fat, 3.32; days in milk, 289.
 Total production, milk, 12,677 lbs.; fat, 421.03 lbs.
 Production required for registration—milk, 9,967.5 lbs.; fat, 338.8 lbs.
- No. 206. '**Aaggie DeKol**,' No. 7928.
 Sire, '**Manor Korndyke Wayne**,' No. 4208.
 Dam, '**Pauline Aaggie DeKol**,' No. 3688.
 Bred and owned by J. W. McCormick, Morewood, Ont.
 Test commenced, January 6, 1911.
 Age at commencement of test, 4 years and 252 days.
 Date of calving, January 5, 1911.
 Date of previous calving, October 10, 1910.
 Date of calving after test, February 24, 1912.
 Average per cent of fat, 3.91; days in milk, 338.
 Total production, milk, 13,119.37 lbs.; fat, 513.54 lbs.
 Production required for registration—milk, 10,193 lbs.; fat, 346.4 lbs.

- No. 212. 'Fancy B. Posch,' No. 8428.
Sire, 'Sir Belle DeKol Posch,' No. 3850.
Dam, 'Fancy B.,' No. 3402.
Owned by Richard Clark, Henfryn, Ont.
Bred by J. H. Patten, Paris, Ont.
Test commenced, April 15, 1911.
Age at commencement of test, 4 years and 14 days.
Date of calving, April 12, 1911.
Date of previous calving, May 6, 1910.
Date of calving after test, February 21, 1912.
Average per cent of fat, 3.9; days in milk, 275.
Total production, milk, 10,403.06 lbs.; fat, 411.32 lbs.
Production required for registration—milk, 9,538.5 lbs.; fat, 336 lbs.
- No. 220. 'Tillie Acema,' No. 6775.
Sire, 'Jack Horner,' No. 2752.
Dam, 'Lady Aaggie's Acme,' No. 3049.
Owned by H. J. Allison, Chesterville, Ont.
Bred by R. O. Morrow, Hilton, Ont.
Test commenced, April 17, 1910.
Age at commencement of test, 4 years and 337 days.
Date of calving, April 14, 1910.
Date of previous calving, April 9, 1909.
Date of calving after test, June 4, 1911.
Average per cent of fat, 3.33; days in milk, 365.
Total production, milk, 12,666.6 lbs.; fat, 429.3 lbs.
Production required for registration—milk, 10,426.75 lbs.; fat, 354.37 lbs.
- No. 221. 'Quora 4th,' No. 6372.
Sire, 'Sir Wilfrid DeKol,' No. 2118.
Dam, 'Quora 2nd,' No. 2057.
Owned by H. J. Allison, Chesterville, Ont.
Bred by Joseph Fletcher, Oxford Mills, Ont.
Test commenced, July 3, 1910.
Age at commencement of test, 4 years, 422 days.
Date of calving, July 3, 1910.
Date of previous calving, May 2, 1909.
Date of calving after test, August 8, 1911.
Average per cent of fat, 3.01; days in milk, 323.
Total production, milk, 14,850 lbs.; fat, 447.87 lbs.
Production required for registration—milk, 10,385.5 lbs.; fat, 352.9 lbs.
- No. 222. 'Rideau Pietertje DeKol,' No. 8594.
Sire, 'Sir Pietertje Posch De Boer,' No. 3362.
Dame, 'Rideau Dellah Princess De Kol,' No. 4612.
Owned by C. Duff, Nelles, Boston, Ont.
Bred by Matt. Richardson, Caledonia, Ont.
Test commenced, February 20, 1911.
Age at commencement of test, 4 years and 38 days.
Date of calving, February 18, 1911.
Date of previous calving, March 21, 1910.
Date of calving after test, February 28, 1912.
Average per cent of fat, 3.25; days in milk, 303.
Total production, milk, 12,144.1 lbs.; fat, 395.55 lbs.
Production required for registration—milk, 9,604.5 lbs.; fat, 353.37 lbs.

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No. 229. 'Princess Netherland Pride,' No. 17025.
 Sire, 'DeKol Barrington Prince,' No. 3067.
 Dam, 'Netherland's Pride,' No. 3573.
 Owned by J. W. McCormick, Morewood, Ont.
 Bred by M. H. Black, Morewood, Ont.
 Test commenced, March 12, 1911.
 Age at commencement of test, 4 years and 337 days.
 Date of calving, March 10, 1911.
 Date of previous calving, May 1, 1910.
 Date of calving after test, March 19, 1912.
 Average per cent of fat, 3.45; days in milk, 337.
 Total production, milk, 11,758.25 lbs.; fat, 406.42 lbs.
 Production required for registration—milk, 10,423 lbs.; fat, 331 lbs.

No. 232. 'Fanny Iosco Pride,' No. 7686.
 Sire, 'Iosco Pride's Pan Am,' No. 2420.
 Dam, 'Fanny Pietertje,' No. 3573.
 Owned by Thos. Hartley, Downsview, Ont.
 Bred by A. E. Hulet, Norwich, Ont.
 Test commenced, September 1, 1910.
 Age at commencement of test, 4 years and 163 days.
 Date of calving, August 29, 1910.
 Date of previous calving, July 9, 1909.
 Date of calving after test, November 29, 1911.
 Average per cent of fat, 3.41; days in milk, 362.
 Total production, milk, 12,273.8 lbs.; fat, 419.7 lbs.
 Production required for registration—milk, 9,962 lbs.; fat, 333.6 lbs.

COWS THREE YEARS OLD AND UNDER FOUR.

No. 159. 'Aaggie Mercedes,' No. 7667.
 Sire, 'Count Cornelius,' No. 3144.
 Dam, 'Netherland Aaggie,' No. 2473.
 Bred and Owned by J. M. VanPatter, Aylmer, Ont., R.F.D. No. 1.
 Test commenced, February 24, 1910.
 Age at commencement of test, 3 years and 54 days.
 Date of calving, February 23, 1909.
 Date of previous calving, January 1, 1909.
 Date of calving after test, April 7, 1911.
 Average per cent of fat, 3.53; days in milk, 365.
 Total production, milk, 13,443.75 lbs.; fat, 475.56 lbs.
 Production required for registration—milk, 3,643.5 lbs.; fat, 294 lbs.

No. 163. 'Dandy DeKol Isabella,' No. 7695.
 Sire, 'Dandy DeKol's Duke,' No. 3209.
 Dam, 'Isabella,' No. 1990.
 Owned by F. I. Burrill, Holbrook, Ont.
 Bred by Arthur Thomas, Zenda, Ont.
 Test commenced, March 19, 1910.
 Age at commencement of test, 3 years and 116 days.
 Date of calving, March 14, 1910.
 Date of previous calving, March 8, 1909.
 Date of calving after test, April 22, 1911.
 Average per cent of fat, 2.88; days in milk, 332.
 Total production, milk, 9,783.95 lbs.; fat, 281.60 lbs.
 Production required for registration—milk, 3,319 lbs.; fat, 267.8 lbs.

No. 169. 'Fancy B. Posch,' No. 8428.
Sire, 'Sir Belle DeKol Posch,' No. 3805.
Dam, 'Fancy B.,' No. 3402.
Owned by R. Clarke, Henfryn, Ont.
Bred by J. H. Patten, Paris, Ont.
Test commenced, May 10, 1910.
Age at commencement of test, 3 years and 40 days.
Date of calving, May 6, 1910.
Date of previous calving, April 1, 1909.
Date of calving after test, April 12, 1911.
Average per cent of fat, 3.91; days in milk, 264.
Total production, milk, 9,145.75 lbs.; fat, 357.82 lbs.
Production required for registration—milk, 8,610 lbs.; fat, 292.7 lbs.

No. 173. 'Desta,' No. 8082.
Sire, 'Sir Mantel Mechthilde,' No. 3604.
Dam, 'Lusina Jemima DeKol,' No. 6670.
Bred and owned by J. B. Arnold, Easton's Corners, Ont.
Test commenced, March 7, 1910.
Age at commencement of test, 3 years and 252 days.
Date of calving, March 4, 1910.
Date of previous calving, December 24, 1908.
Date of calving after test, May 26, 1911.
Average per cent of fat, 2.99; days in milk, 365.
Total production, milk, 18,993.39 lbs.; fat, 568.32 lbs.
Production required for registration—milk, 9,193 lbs.; fat, 312.5 lbs.

No. 179. 'Princess Susie of Malahide,' No. 8085.
Sire, 'Sir Paul Holland,' No. 3592.
Dam, 'Sarah Queen of Middleton,' No. 5033.
Owned by E. Laidlaw & Sons, Aylmer West, Ont.
Bred by Chas. H. Crossett, Tillsonburg, Ont.
Test commenced, May 3, 1910.
Age at commencement of test, 3 years and 338 days.
Date of calving, May 2, 1910.
Date of previous calving, April 4, 1909.
Date of calving after test, May 10, 1911.
Average per cent of fat, 3.57; days in milk, 302.
Total production, milk 12,167 lbs.; fat, 434.75 lbs.
Production required for registration—milk, 9,429.5 lbs.; fat, 320 lbs.

No. 181. 'Brooklands Korndyke Wayne,' No. 9517.
Sire, 'Manor Korndyke Wayne,' No. 4208.
Dam, 'Brookland's Sadie,' No. 5514.
Bred and owned by J. W. McCormick, Morewood, Ont.
Test commenced, June 9, 1910.
Age at commencement of test, 3 years and 64 days.
Date of calving, June 9, 1910.
Date of previous calving, June 17, 1909.
Date of calving after test, August 17, 1911.
Average per cent of fat, 3.54; days in milk, 365.
Total production, milk, 11,545.68 lbs.; fat, 408.77 lbs.
Production required for registration—milk, 8,676 lbs.; fat, 295 lbs.

No. 184. 'Pontiac Lula,' No. 9853.
Sire, 'Pontiac Hermas,' No. 5442.

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Dam, 'Sylvan Agatha,' No. 5104.

Owned by Monro & Lawless, Thorold, Ont.

Bred by H. G. George, Crampton, Ont.

Test commenced, May 4, 1910.

Age at commencement of test, 3 years and 5 days.

Date of calving, May 1, 1910.

Date of calving after test, May 12, 1911.

Average per cent of fat, 3.16; days in milk, 335.

Total production, milk, 11,882 lbs.; fat, 376.47 lbs.

Production required for registration—milk, 8,513.75 lbs.; fat, 293.6 lbs.

No. 202. 'Niagara Maid,' No. 9353.

Sire, 'Count Mercena Posch,' No. 3902.

Dam, 'Ferndale Maid,' No. 6952.

Owned by John C. Brown, Stamford, Ont.

Bred by Jas. Rettie, Norwich, Ont.

Test commenced, October 6, 1910.

Age at commencement of test, 3 years and 48 days.

Date of calving, October 5, 1910.

Date of previous calving, May 22, 1909.

Date of calving after test, December 12, 1911.

Average per cent of fat, 3.74; days in milk, 365.

Total production, milk, 13,650 lbs.; fat, 511.31 lbs.

Production required for registration—milk, 8,632 lbs.; fat, 293.5 lbs.

No. 208. 'Korndyke Pauline DeKol,' No. 9320.

Sire, 'Manor Korndyke Wayne,' No. 4208.

Dam, 'Pauline Aaggie DeKol 2nd,' No. 5889.

Bred and owned by J. W. McCormick, Morewood, Ont.

Test commenced, March 3, 1911.

Age at commencement of test, 3 years and 327 days.

Date of calving, March 1, 1911.

Date of previous calving, April 27, 1910.

Date of calving after test, February 21, 1912.

Average per cent of fat, 3.7; days in milk, 347.

Total production, milk, 9,501.37 lbs.; fat, 357.46 lbs.

Production required for registration—milk, 9,399.25 lbs.; fat, 319.44 lbs.

No. 213. 'Korndyke DeKol Daisy,' No. 10317.

Sire, 'Korndyke Lilly DeKol,' No. 3265.

Dam, 'Daisy of Meadowlane,' No. 6337.

Owned by R. Clarke, Henfryn, Ont.

Bred by B. Mallory, Belleville, Ont.

Test commenced, March 24, 1911.

Age at commencement of test, 3 years and 25 days.

Date of calving, March 23, 1911.

Date of previous calving, February 22, 1910.

Date of calving after test, February 1, 1912.

Average per cent of fat, 3.68; days in milk, 251.

Total production, milk, 10,034.31 lbs.; fat, 369.59 lbs.

Production required for registration—milk, 8,568.75 lbs.; fat, 312.27 lbs.

No. 219. 'Cloverleaf Faforit Mercena,' No. 9147.

Sire, 'Count Mercena Posch,' No. 3902.

Dam, 'Faforit 10th's Beauty,' No. 5622.

Owned by A. E. Smith & Son, Millgrove, Ont.
 Bred by R. F. Hicks, Newton Brook, Ont.
 Test commenced, December 1, 1910.
 Age at commencement of test, 3 years and 262 days.
 Date of calving, November 30, 1910.
 Date of previous calving, October 3, 1909.
 Date of calving after test, February 10, 1912.
 Average per cent of fat, 3.19; days in milk, 365.
 Total production, milk, 14,281.5 lbs; fat, 456.36 lbs.
 Production required for registration—milk, 9,220.5 lbs.; fat, 313.39 lbs.

No. 226. 'Manor DeKol Netherland,' No. 9603.
 Sire, 'Manor Prince DeKol,' No. 3735.
 Dam, 'Inka Netherland Bessie,' No. 6364.
 Owned by J. W. McCormick, Morewood, Ont.
 Bred by Stanley Stephenson, Cannamore, Ont.
 Test commenced, January 11, 1911.
 Age at commencement of test, 3 years and 264 days.
 Date of calving, January 10, 1911.
 Date of calving after test, March 6, 1912.
 Average per cent of fat, 4.45; days in milk, 365.
 Total production, milk, 10,397.5 lbs.; fat, 462.82 lbs.
 Production required for registration—milk, 9,226 lbs.; fat, 313.5 lbs.

No. 227. 'Madam B. 2nd's Pauline,' No. 9218.
 Sire, 'Prince Pauline DeKol 6th,' No. 2467.
 Dam, 'Madame B. 2nd,' No. 3528.
 Bred and owned by R. W. Walker, Utica, Ont.
 Test commenced, November 24, 1910.
 Age at commencement of test, 3 years and 188 days.
 Date of calving, November 21, 1910.
 Date of previous calving, April 26, 1909.
 Date of calving after test, January 24, 1912.
 Average per cent of fat, 3.46; days in milk, 363.
 Total production, milk, 9,590.55 lbs.; fat, 332.74 lbs.
 Production required for registration—milk, 9,017 lbs.; fat, 306.5 lbs.

No. 230. 'Violet's Daisy's Pauline,' No. 9132.
 Sire, 'Prince Pauline DeKol A,' No. 3284.
 Dam, 'Violet's Daisy,' No. 4863.
 Owned by Dr. John Watson, Howick, Que.
 Bred by John Purse, Herdman, Que.
 Test commenced, March 9, 1911.
 Age at commencement of test, 3 years and 360 days.
 Date of calving, March 7, 1911.
 Date of previous calving, April, 1910.
 Date of calving after test, March 9, 1912.
 Average per cent of fat, 3.7; days in milk, 310.
 Total production, milk, 11,470.75 lbs.; fat, 423.90 lbs.
 Production required for registration—milk, 9,486.25 lbs.; fat, 322.5 lbs.

COWS TWO YEARS OLD AND UNDER THREE.

No. 160. 'Canaan Beauty,' No. 8457.
 Sire, 'Lilly's Judge Akkrum DeKol,' No. 2484.
 Dam, 'Holland Beauty,' No. 2117.

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Bred and owned by F. E. Came, St. Lambert, Que.
 Test commenced, March 7, 1910.
 Age at commencement of test, 2 years and 360 days.
 Date of calving, March 7, 1910.
 Date of calving after test, April 11, 1911.
 Average per cent of fat, 3.09; days in milk, 365.
 Total production, milk, 9,431 lbs.; fat, 291.58 lbs.
 Production required for registration—milk, 8,490 lbs.; fat, 288.5 lbs.

No. 161. '**Lady Fairmont Posch**,' No. 10679.
 Sire, '**Sir Christopher Wren**,' No. 6600.
 Dam, '**Irene Fairmont**,' No. 6858.
 Bred and owned by F. I. Burrill, Holbrook, Ont.
 Test commenced, April 8, 1910.
 Age at commencement of test, 2 years and 30 days.
 Date of calving, April 5, 1910.
 Date of calving after test, April 11, 1911.
 Average per cent of fat, 2.95; days in milk, 308.
 Total production, milk, 9,525.17 lbs.; fat, 281.30 lbs.
 Production required for registration—milk, 7,582.5 lbs.; fat, 263 lbs.

No. 164. '**Polly Woodland DeKol**,' No. 10390.
 Sire, '**Woodland Sarcastic Lad**,' No. 4890.
 Dam, '**Bessie Jane DeKol**,' No. 7365.
 Bred and owned by S. M. Peacock, Mt. Salem, Ont.
 Test commenced, March 10, 1910.
 Age at commencement of test, 1 year and 360 days.
 Date of calving, March 10, 1910.
 Date of calving after test, May 1, 1911.
 Average per cent of fat, 3.20; days in milk, 365.
 Total production, milk, 9,433.15 lbs.; fat, 302.64 lbs.
 Production required for registration—milk, 7,500 lbs.; fat, 255 lbs.

No. 167. '**Aaggie DeKol of Woodland**,' No. 10413.
 Sire, '**Woodland Sarcastic Lad**,' No. 4890.
 Dam, '**Aaggie DeKol Schuiling**,' No. 7666.
 Bred and owned by J. M. VanPatter, Aylmer, Ont.
 Test commenced, June 24, 1910.
 Age at commencement of test, 2 years and 68 days.
 Date of calving, June 23, 1910.
 Date of calving after test, August 11, 1911.
 Average per cent of fat, 3.21; days in milk, 365.
 Total production, milk, 11,884.5 lbs.; fat, 382.31 lbs.
 Production required for registration—milk, 7,637 lbs.; fat, 261.3.

No. 168. '**Korndyke DeKol Daisy**,' No. 10317.
 Sire, '**Korndyke Lily DeKol**,' No. 3263.
 Dam, '**Daisy of Meadowlane**,' No. 6337.
 Owned by Richard Clarke, Henfryn, Ont.
 Bred by B. Mallory, Belleville, Ont.
 Test commenced, February 26, 1910.
 Age at commencement of test, 1 year and 364 days.
 Date of calving, January 22, 1910.
 Date of calving after test, March 23, 1911.
 Average per cent of fat, 3.61; days in milk, 302.
 Total production, milk, 9,685.75 lbs.; fat, 349.52 lbs.
 Production required for registration—milk, 7,500 lbs.; fat, 255 lbs.

- No. 170. 'Diana Woodland Sarcastic,' No. 10389.
Sire, 'Woodland Sarcastic Lad,' No. 4890.
Dam, 'Queen Jane,' No. 6509.
Bred and owned by G. E. Peacock, Mt. Salem, Ont.
Test commenced, March 25, 1910.
Age at commencement of test, 1 year and 354 days.
Date of calving, March 25, 1910.
Date of calving after test, May 15, 1911.
Average per cent of fat, 3.91; days in milk, 358.
Total production, milk, 9,595.45 lbs.; fat, 375.23 lbs.
Production required for registration—milk, 7,500 lbs.; fat, 255 lbs.
- No. 171. 'Korndyke Wayne DeKol,' No. 9609.
Sire, 'Manor Korndyke Wayne,' No. 4208.
Dam, 'Amy Peep 3rd,' No. 5513.
Bred and owned by J. W. McCormick, Morewood, Ont.
Test commenced, March 24, 1910.
Age at commencement of test, 2 years and 270 days.
Date of calving, March 23, 1910.
Date of calving after test, April 11, 1911.
Average per cent of fat, 3.738; days in milk, 340.
Total production, milk, 10,932 lbs.; fat, 408.70 lbs.
Production required for registration—milk, 8,242.5 lbs.; fat, 280 lbs.
- No. 177. 'Pauline DeKol Albino,' No. 9621.
Sire, 'Sir Mutual Butter Boy 2nd,' No. 3827.
Dam, 'Pauline Albino DeKol,' No. 3231.
Owned by S. J. Carlyle, Chesterville, Ont.
Bred by R. O. Morrow, Hilton, Ont.
Test commenced, April 1, 1910.
Age at commencement of test, 2 years and 270 days.
Date of calving, March 26, 1910.
Date of calving after test, May 2, 1911.
Average per cent of fat, 3.26; days in milk, 365.
Total production, milk, 11,071.6 lbs.; fat, 361.77 lbs.
Production required for registration—milk, 8,242.5 lbs.; fat, 280 lbs.
- No. 178. 'Belle Dewdrop 6th,' No. 10133.
Sire, 'Lord Robert DeKol,' No. 3597.
Dam, 'Belle Dewdrop,' No. 4083.
Owned by E. Laidlaw & Sons, Aylmer West, Ont.
Bred by E. Laidlaw, Aylmer, Ont.
Test commenced, April 10, 1910.
Age at commencement of test, 1 year and 349 days.
Date of calving, April 9, 1910.
Date of calving after test, May 13, 1911.
Average per cent of fat, 2.97; days in milk, 312.
Total production, milk, 11,391 lbs.; fat, 338.39 lbs.
Production required for registration—milk, 7,500 lbs.; fat, 255 lbs.
- No. 182. 'Queen's Pride of DeKol,' No. 10955.
Sire, 'Katie's Iosco DeKol,' No. 3350.
Dam, 'Queen of Minster,' No. 2203.
Bred and owned by R. Honey, Brickley, Ont.
Test commenced, May 18, 1910.

SESSIONAL PAPER No. 15b

Age at commencement of test, 2 years and 58 days.
 Date of calving, May 15, 1910.
 Date of calving after test, July 14, 1911.
 Average per cent of fat, 3.04; days in milk, 365.
 Total production, milk, 9,718.25 lbs.; fat, 295.82 lbs.
 Production required for registration—milk, 7,659.5 lbs.; fat, 260 lbs.

No. 187. 'Lucy DeKol Posch,' No. 8326.

Sire, 'Tiny's Posch,' No. 4785.

Dam, 'Jean DeKol,' No. 5357.

Owned by J. M. VanPatter, Alymer, Ont., R.F.D. No. 1.

Bred by A. Crichton, St. George, Ont.

Test commenced, February 22, 1910.

Age at commencement of test, 2 years and 335 days.

Date of calving, February 21, 1910.

Date of calving after test, April 30, 1911.

Average per cent of fat, 3.31; days in milk, 365.

Total production, milk, 12,328.75 lbs.; fat, 408.18 lbs.

Production required for registration—milk, 8,421.25 lbs.; fat, 286.18 lbs.

No. 192. 'Canaan Mosetta,' No. 8527.

Sire, 'Lilly's Judge Akkrum DeKol,' No. 2484.

Dam, 'Lovelia 2nd's Aaggie,' No. 2318.

Bred and owned by F. E. Came, St. Lambert, Que.

Test commenced, February 21, 1910.

Age at commencement of test, 2 years and 351 days.

Date of calving, February 21, 1910.

Date of previous calving, March 30, 1909.

Date of calving after test, May 5, 1911.

Average per cent of fat, 3.47; days in milk, 366.

Total production, milk, 9,701 lbs.; fat, 336.93 lbs.

Production required for registration—milk, 8,464.25 lbs.; fat, 326.7 lbs.

No. 193. 'National Queen DeKol,' No. 10134.

Sire, 'Lord Roberts DeKol,' No. 3597.

Dam, 'Faultless Queen DeKol,' No. 5794.

Bred and owned by E. Laidlaw & Sons, Aylmer West, Ont.

Test commenced, October 28, 1910.

Age at commencement of test, 2 years and 86 days

Date of calving, October 19, 1910.

Date of calving after test, November 24, 1911.

Average per cent of fat, 3.43; days in milk, 316.

Total production, milk, 14,735.5 lbs.; fat, 506.16 lbs.

Production required for registration—milk, 7,736.5 lbs.; fat, 265 lbs.

No. 194. 'Lady Calamity Pauline,' No. 11248.

Sire, 'Frontier Paul DeKol,' No. 6159.

Dam, 'Josephine Paul Calamity,' No. 8590.

Owned by Cecil W. Hagar, Welland, Ont.

Bred by G. A. Gilroy, Glen Buell, Ont.

Test commenced, November 2, 1910.

Age at commencement of test, 2 years and 13 days.

Date of calving, October 31, 1910.

Date of calving after test, December 9, 1911.

Average per cent of fat, 3.20; days in milk, 365.

Total production, milk, 10,369.81 lbs.; fat, 332.73 lbs.

Production required for registration—milk, 7,535.75 lbs.; fat, 256.2 lbs.

- No. 195. '**Doris Lee Pietertje**,' No. 9011.
Sire, '**Lee Court Verbelle**,' No. 3076.
Dam, '**DeKol Pietertje Doris**,' No. 3994.
Owned by S. J. Foster, Bloomfield, Ont.
Bred by R. W. Ireland, Smithfield, Ont.
Test commenced, April 8, 1910.
Age at commencement of test, 2 years and 40 days.
Date of calving, April 7, 1910.
Date of calving after test, May 15, 1911.
Average per cent of fat, 3.57; days in milk, 327.
Total production, milk, 11,324.75 lbs.; fat, 404.96 lbs.
Production required for registration—milk, 7,610 lbs.; fat, 258.7 lbs.
- No. 197. '**Aaggie Emily of Riverside**,' No. 10253.
Sire, '**Sir Pietertje Posch DeBoer**,' No. 3362.
Dam, '**Aaggie's Emily**,' No. 3568.
Owned by L. W. Hutchinson, Aurora, Ont.
Bred by Matt. Richardson, Caledonia, Ont.
Test commenced, August 10, 1910.
Age at commencement of test, 2 years and 181 days.
Date of calving, August 6, 1910.
Date of calving after test, October 22, 1911.
Average per cent of fat, 3.16; days in milk, 365.
Total production, milk, 14,376.5 lbs.; fat, 455.27 lbs.
Production required for registration—milk, 7,997.75 lbs.; fat, 272.35 lbs.
- No. 199. '**Buffalo Girl Butter Maid**,' No. 11651.
Sire, '**Brookbank Butter Baron**,' No. 2955.
Dam, '**Beauty's Butter Girl**,' No. 3562.
Owned by Tig. Wood, Mitchell, Ont.
Bred by P. D. Ede, Oxford Centre, Ont.
Test commenced, December 5, 1910.
Age at commencement of test, 2 years and 17 days.
Date of calving, December 5, 1910.
Date of calving after test, December 4, 1911.
Average per cent of fat, 3.38; days in milk, 328.
Total production, milk, 13,114.4 lbs.; fat, 443.34 lbs.
Production required for registration—milk, 7,546.75 lbs.; fat, 256.5 lbs.
- No. 201. '**Bessie DeKol of Niagara**,' No. 9354.
Sire, '**Count Mercena Posch**,' No. 3902.
Dam, '**Bessie DeKol of Whittaker**,' No. 6954.
Owned by John C. Brown, Stamford, Ont.
Bred by Jas. Rettie, Norwich, Ont.
Test commenced, October 9, 1910.
Age at commencement of test, 2 years and 240 days.
Date of calving, October 8, 1910.
Date of previous calving, June 7, 1909.
Date of calving after test, December 15, 1911.
Average per cent of fat, 3.44; days in milk, 365.
Total production, milk, 13,439.18 lbs.; fat, 462.86 lbs.
Production required for registration—milk, 8,160 lbs.; fat, 277.3 lbs.
- No. 204. '**Johanna Mercedes of Riverside**,' No. 10858.
Sire, '**Sir Pietertje Posch De Boer**,' No. 3362.
Dam, '**Inka Mercedes DeKol 4th**,' No. 6191.

SESSIONAL PAPER No. 15b

Owned by C. Duff. Nelles, Boston, Ont.
 Bred by J. W. Richardson, Caledonia, Ont.
 Test commenced, December 9, 1910.
 Age at commencement of test, 1 year and 364 days.
 Date of calving, December 8, 1910.
 Date of calving after test, December 23, 1911.
 Average per cent of fat, 3.27; days in milk, 336.
 Total production, milk, 11,520.7 lbs.; fat, 377.56 lbs.
 Production required for registration—milk, 7,500 lbs.; fat, 255 lbs.

No. 205. '**Belle Mercedes Posch**,' No. 12117.
 Sire, '**Count Posch Mechthilde**,' No. 5213.
 Dam, '**Glenside Peach Bloom**,' No. 7872.
 Owned by Elias Ruby, Hickson, Ont.
 Bred by Geo. North, Guelph, Ont.
 Test commenced, December 1, 1910.
 Age at commencement of test, 2 years and 10 days.
 Date of calving, November 21, 1910.
 Date of calving after test, January 8, 1912.
 Average per cent of fat, 3.19; days in milk, 365.
 Total production, milk, 9,265.75 lbs.; fat, 295.74 lbs.
 Production required for registration—milk, 7,527.5 lbs.; fat, 255.9 lbs.

No. 207. '**Lulu Keyes**,' No. 10333.
 Sire, '**Inka Darkness Keyes**,' No. 3287.
 Dam, '**Disone 2nd's Lulu**,' No. 2982.
 Owned by E. B. Mallory, Frankford, Ont.
 Bred by B. Mallory, Belleville, Ont.
 Test commenced, January 11, 1911.
 Age at commencement of test, 2 years and 341 days.
 Date of calving, January 8, 1911.
 Date of previous calving, January 19, 1910.
 Date of calving after test, February 1, 1912.
 Average per cent of fat, 2.81; days in milk, 365.
 Total production, milk, 19,258.45 lbs.; fat, 542.67 lbs.
 Production required for registration—milk, 8,437.75 lbs.; fat, 236.7 lbs.

No. 210. '**Utica Teake DeKol**,' No. 9009.
 Sire, '**Utica Lad**,' No. 3052.
 Dam, '**Sady's Teake's Tirania DeKol**,' No. 5207.
 Owned by A. J. Tambllyn, Orono, Ont.
 Bred by Geo. Black, Winchester, Ont.
 Test commenced, December 2, 1910.
 Age at commencement of test, 2 years and 274 days.
 Date of calving, December 2, 1910.
 Date of calving after test, January 6, 1912.
 Average per cent of fat, 3.48; days in milk, 365.
 Total production, milk, 10,440.5 lbs.; fat, 363.71 lbs.
 Production required for registration—milk, 8,253.5 lbs.; fat, 280.5 lbs.

No. 211. '**Princess Concordia**,' No. 11445.
 Sire, '**Beryl Wayne Paul Concordia**,' No. 3130.
 Dam, '**Princess May DeKol**,' No. 3303.
 Owned by A. J. Tambllyn, Orono, Ont.
 Bred by Jas. Scott, Winchester, Ont.

3 GEORGE V., A. 1913

Test commenced, December 4, 1910.

Age at commencement of test, 2 years and 184 days.

Date of calving, December 4, 1910.

Date of calving after test, January 5, 1912.

Average per cent of fat, 3.29; days in milk, 365.

Total production, milk, 11,401 lbs.; fat, 375.96 lbs.

Production required for registration—milk, 8,006 lbs.; fat, 272.1 lbs.

No. 214. 'Sady Teake DeKol Beryl,' No. 12564.

Sire, 'Beryl Wayne Paul Concordia,' No. 3130.

Dam, 'Sady's Teake's Maple Glen Countess,' No. 1682.

Owned by R. Clarke, Henfryn, Ont.

Bred by Wm. Higginson, Inkerman, Ont.

Test commenced, February 10, 1911.

Age at commencement of test, 2 years and 42 days.

Date of calving, February 7, 1911.

Date of calving after test, January 26, 1912.

Average per cent of fat, 3.46; days in milk, 293.

Total production, milk, 8,864.81 lbs.; fat, 307.41 lbs.

Production required for registration—milk, 7,615.5 lbs.; fat, 258.9 lbs.

No. 217. 'Boutsje Posch DeBoer,' No. 8634.

Sire, 'Prince Posch Pietertje C,' No. 4164.

Dam, 'Lulu Glaser,' No. 5099.

Owned by S. Lemon, Lynden, Ont.

Bred by G. W. Clemons, St. George, Ont.

Test commenced, November 21, 1910.

Age at commencement of test, 2 years and 363 days.

Date of calving, November 20, 1910.

Date of calving after test, January 25, 1912.

Average per cent of fat, 3.6; days in milk, 349.

Total production, milk, 10,700.9 lbs.; fat, 391.93 lbs.

Production required for registration—milk, 8,504.50 lbs.; fat, 287.14 lbs.

No. 218.—'Agnes Evergreen,' No. 10339.

Sire, 'Evergreen's Teake,' No. 5041.

Dam, 'Alice Posch,' No. 7462.

Owned by S. Lemon, Lynden, Ont.

Bred by G. W. Clemons, St. George, Ont.

Test commenced, November 17, 1910.

Age at commencement of test, 2 years and 180 days.

Date of calving, November 16, 1910.

Date of calving after test, December 21, 1911.

Average per cent of fat, 3.4; days in milk, 344.

Total production, milk, 9,423.6 lbs.; fat, 324.67 lbs.

Production required for registration—milk, 7,995 lbs.; fat, 271.75 lbs.

No. 223. 'Korndyke Pauline DeKol 2nd,' No. 11573.

Sire, 'Manor Korndyke Wayne,' No. 4208.

Dam, 'Pauline Aaggie DeKol 2nd,' No. 5889.

Bred and owned by J. W. McCormick, Morewood, Ont.

Test commenced, March 5, 1911.

Age at commencement of test, 2 years and 270 days.

Date of calving, March 3, 1911.

Date of calving after test, February 23, 1912.

SESSIONAL PAPER No. 15b

Average per cent of fat, 4.25; days in milk, 333.
Total production, milk, 8,975 lbs.; fat, 381.59 lbs.
Production required for registration—milk, 8,247.5 lbs.; fat, 282.12 lbs.

No. 224. 'Korndyke DeKol Queen,' No. 14124.

Sire, 'Manor Prince DeKol 2nd,' No. 6486.

Dam, 'Brooklands Korndyke Wayne,' No. 9517.

Bred and owned by J. W. McCormick, Morewood, Ont.

Test commenced, April 19, 1911.

Age at commencement of test, 1 year and 304 days.

Date of calving, April 17, 1911.

Date of calving after test, March 7, 1912.

Average per cent of fat, 3.84; days in milk, 307.

Total production, milk, 7,548.75 lbs.; fat, 290.35 lbs.

Production required for registration—milk, 7,500 lbs.; fat, 255 lbs.

No. 225. 'Brooklands Korndyke Gem,' No. 11812.

Sire, 'Calamity Korndyke Wayne,' No. 5669.

Dam, 'Korndyke Belle,' No. 8360.

Bred and owned by J. W. McCormick, Morewood, Ont.

Test commenced, March 23, 1911.

Age at commencement of test, 2 years and 239 days.

Date of calving, March 21, 1911.

Date of calving after test, March 14, 1912.

Average per cent of fat, 3.8; days in milk, 327.

Total production, milk, 8,615.06 lbs.; fat, 334.91 lbs.

Production required for registration—milk, 8,157.25 lbs.; fat, 277.25 lbs.

No. 226. 'Summer Hill May,' No. 9288.

Sire, 'John Henry Acme DeKol,' No. 3668.

Dam, 'Springbrook Countess,' No. 1572.

Owned by John F. Smith, Armitage, Ont.

Bred by Geo. R. Hanes, Dundas, Ont.

Test commenced, January 8, 1911.

Age at commencement of test, 2 years and 331 days.

Date of calving, January 8, 1911.

Date of previous calving, December 23, 1909.

Date of calving after test, March 14, 1912.

Average per cent of fat, 3.04; days in milk, 319.

Total production, milk, 10,242.5 lbs.; fat, 311.90 lbs.

Production required for registration—milk, 8,410.25 lbs.; fat, 285.8 lbs.

No. 231. 'Princess Calamity Posch DeKol,' No. 10505.

Sire, 'King Posch DeKol,' No. 4529.

Dam, 'Princess Calamity Wayne,' No. 6142.

Owned by Tig. Wood, Mitchell, Ont.

Bred by Walburn Rivers, Folden's, Ont.

Test commenced, February 14, 1911.

Age at commencement of test, 2 years and 82 days.

Date of calving, February 14, 1911.

Date of calving after test, March 2, 1912.

Average per cent of fat, 3.14; days in milk, 336.

Total production, milk, 11,021.5 lbs.; fat, 347.12 lbs.

Production required for registration—milk, 7,725.5 lbs.; fat, 262.6 lbs.

- No. 233. 'Gertie Posch Westwoud,' No. 11862.
 Sire, 'Cornelia's Posch,' No. 2250.
 Dam, 'Lilly Westwoud 2nd,' No. 3966.
 Bred and owned by Thos. Hartley, Downsview, Ont.
 Test commenced, December 26, 1910.
 Age at commencement of test, 2 years and 125 days.
 Date of calving, December 25, 1910.
 Date of calving after test, February 19, 1912.
 Average per cent of fat, 3.15; days in milk, 363.
 Total production, milk, 10,869.82 lbs.; fat, 343.064 lbs.
 Production required for registration—milk, 7,843.75 lbs.; fat, 266.6 lbs.
- No. 234. 'Schuiling Pride 2nd,' No. 12007.
 Sire, 'Lady Pietertje Mercedes' Paul,' No. 3893.
 Dam, 'Schuiling Pride,' No. 2377.
 Bred by Samuel Pool, Norwich, Ont.
 Owned by Thos. Hartley, Downsview, Ont.
 Test commenced, December 25, 1910.
 Age at commencement of test, 2 years and 55 days.
 Date of calving, December 25, 1910.
 Date of calving after test, January 29, 1912.
 Average per cent of fat, 3.97; days in milk, 365.
 Total production, milk, 7,872.6 lbs.; fat, 312.691 lbs.
 Production required for registration—milk, 7,651.25 lbs.; fat, 260 lbs.

JERSEY.

COWS FIVE YEARS OLD AND OVER.

Production required for registration: milk, 8,500 lbs.; fat, 337 lbs.

- No. 7. 'Fancy's Countess,' No. 694.
 Sire, 'Koffee's Count,' No. 24405. A.J.C.C.
 Dam, 'Fancy's Mamie,' No. 97264. A.J.C.C.
 Bred and owned by A. H. Menzies & Son, Pender Island, B.C.
 Test commenced, March 19, 1910.
 Age at commencement of test, 8 years.
 Date of calving, March 19, 1910.
 Date of previous calving, February 25, 1909.
 Date of calving after test, May 15, 1911.
 Average per cent of fat, 5.75; days in milk, 365.
 Total production, milk, 8,589.5 lbs.; fat, 493.88 lbs.
- No. 11. 'Aristocrat's Fanny,' No. 1188.
 Sire, 'Baron,' No. 2845.
 Dam, 'Mon Plaisir's Fanny,' No. 203640. A.J.C.C.
 Owned by B. H. Bull & Sons, Brampton, Ont.
 Bred by P. J. Prialux, Jersey.
 Test commenced, September 30, 1910.
 Age at commencement of test, 8 years.
 Date of calving, September 30, 1910.
 Date of previous calving, October 1909.
 Date of calving after test, October 2, 1911.
 Average per cent of fat, 4.86; days in milk, 365.
 Total production, milk, 11,097.5 lbs.; fat, 539.48 lbs.

SESSIONAL PAPER No. 15b

No. 13. 'Brampton Blue Fly,' No. 300.

Sire, 'Blue Blood of Dentonia,' No. 52,893. A.J.C.C.

Dam, 'Brampton Pretty Maid,' No. 280.

Bred and owned by B. H. Bull & Sons, Brampton, Ont.

Test commenced, October 14, 1910.

Age at commencement of test, 5 years and 356 days.

Date of calving, October 14, 1910.

Date of previous calving, October 9, 1908.

Date of calving after test, December 3, 1911.

Average per cent of fat, 5.12; days in milk, 365.

Total production, milk, 9,982.4 lbs.; fat, 511.91 lbs.

COWS FOUR YEARS OLD AND UNDER FIVE.

No. 8. 'Lady Buttercup of Pender,' No. 693.

Sire, 'Dona's Dewey,' No. 69211. A.J.C.C.

Dam, 'Princess May Victor,' No. 177110. A.J.C.C.

Bred and owned by A. H. Menzies & Son, Pender Island, B.C.

Test commenced, March 5, 1910.

Age at commencement of test, 4 years and 26 days.

Date of calving, March 5, 1910.

Date of previous calving, January 16, 1909.

Date of calving after test, June 5, 1911.

Average per cent of fat, 5.01; days in milk, 365.

Total production, milk, 9,305.5 lbs.; fat, 466.52 lbs.

Production required for registration, milk, 7,571.5 lbs.; fat, 300 lbs.

No. 9. 'Golden Milkmaid,' No. 1483.

Sire, 'Milkmaid's Prize,' No. 69160. A.J.C.C.

Dam, 'Golden Colea,' No. 182124. A.J.C.C.

Owned by A. H. Menzies & Son, Pender Island, B.C.

Bred by D. & A. Deacon, Mayne Island, B.C.

Test commenced, September 27, 1910.

Age at commencement of test, 4 years and 245 days.

Date of calving, September 26, 1910.

Date of previous calving, September 17, 1909.

Date of calving after test, October 29, 1911.

Average per cent of fat, 4.85; days in milk, 238.

Total production, milk, 8,442.3 lbs.; fat, 409.41 lbs.

Production required for registration—milk, 8,168.25 lbs.; fat, 323.7 lbs.

COWS TWO YEARS OLD AND UNDER THREE.

No. 10. 'Lady Flora,' No. 729.

Sire, 'Star's Rex,' No. 102.

Dam, 'Rosalin of Maple Grove,' No. 153301. A.J.C.C.

Bred and owned by Wm. Clark, North Wiltshire, P.E.I.

Test commenced, March 10, 1911.

Age at commencement of test, 2 years and 164 days.

Date of calving, March 5, 1911.

Date of calving after test, December 3, 1911 (premature).

Average per cent of fat, 4.55; days in milk, 266.

Total production, milk, 7,549.87 lbs.; fat, 343.34 lbs.

Production required for registration—milk, 5,951 lbs.; fat, 236 lbs.

No. 12. '**Brampton Fereor Tister**,' No. 987.Sire, '**Fereor**,' No. 391.Dam, '**Brampton Tister Dot**,' No. 201762. A.J.C.C.

Bred and owned by B. H. Bull & Sons, Brampton, Ont.

Test commenced, September 2, 1910.

Age at commencement of test, 2 years and 14 days.

Date of calving, September 1, 1910.

Date of calving after test, September 30, 1911.

Average per cent of fat, 4.9; days in milk, 364.

Total production, milk, 6,576 lbs.; fat, 326.28 lbs.

Production required for registration—milk, 5,885 lbs.; fat, 219.54 lbs.

AYRSHIRE BULLS QUALIFIED FOR REGISTRATION.No. 1. '**Dairyman of Glenora**,' Reg. No. 13475.

Daughters qualified—

1st. '**Susie of Hickory Hill**,' No. 22336.Dam, '**Briery Banks Susie**,' No. 2847.2nd. '**Jubilee of Hickory Hill**,' No. 23480.Dam, '**Jubilee of Hickory Hill**,' No. 12071.3rd. '**Rosalie of Hickory Hill**,' No. 23482.Dam, '**Ladysmith**,' No. 12394.4th. '**Snowflake of Hickory Hill**,' No. 23481.Dam, '**Helen of Warkworth**,' No. 14184.5th. '**Snowdrop of Hickory Hill**,' No. 23599.Dam, '**Gipsy Maid**,' No. 12391.6th. '**Pet of Hickory Hill**,' No. 21259.Dam, '**Flower of Hickory Hill**,' No. 12031.No. 2. '**Full Bloom of Hindsward**,' Reg. No. 16936.

Daughters qualified—

1st. '**Isaleigh Nancy 1st**,' No. 20525.Dam, '**Nancy of Fairfield Mains**,' No. 11086.2nd. '**Daisy of Westland**,' No. 21799.Dam, '**Daisy of Carlheim**,' No. 11548.3rd. '**Miss Orlia**,' No. 20098.Dam, '**Isaleigh Carlina**,' No. 18280.4th. '**Isaleigh Miss Sandy**,' No. 23827.Dam, '**Miss Sandilands**,' No. 8934.No. 3. '**The Miller o'the Dee**,' Reg. No. 10422.

Daughters qualified—

1st. '**Ruth**,' No. 23598.Dam, '**Primrose of Tanglewyld**,' No. 15943.2nd. '**Bonnie Doon**,' No. 19437.Dam, '**Sprightly 5th**,' No. 2587.3rd. '**Madge**,' No. 27700.Dam, '**Bonnie Doon**,' No. 19437.4th. '**Oddity**,' No. 27699.Dam, '**Little Queen 3rd**,' No. 13570.No. 4. '**Hamilton Chief**,' Reg. No. 17491.

Daughters qualified—

1st. '**Sybella of Springbank**,' No. 27691.

SESSIONAL PAPER No. 15b

- Dam, 'Lady White of Springbank,' No. 27690.
 2nd. 'Jemima of Springbank,' No. 27689.
 Dam, 'Jemima,' No. 27688.
 3rd. 'Briery of Springbank,' No. 29616.
 Dam, 'Briery Banks Mermaid,' No. 3498.
 4th. 'Speck of Springbank,' No. 29619.
 Dam, 'Stylish Alice,' No. 29621.
 5th. 'Ruby Springbank,' No. 29622.
 Dam, 'May Blossom,' No. 29342.
 6th. 'Jemima of Springbank 2nd,' No. 29618.
 Dam, 'Jemima,' No. 27688.

No. 5. 'Scottie,' Reg. No. 19718.

Daughters qualified—

- 1st. 'White Legged Kirsty,' No. 21958.
 Dam, 'White Wings,' No. 9304.
 2nd. 'Scottie's Nancy,' No. 24265.
 Dam, 'Nancy 2nd,' No. 19780.
 3rd. 'Scottie's Lassie,' No. 24264.
 Dam, 'Lassie 2nd,' No. 13189.
 4th. 'Peggy Murphy,' No. 27252.
 Dam, 'Daisy of Brookside,' No. 13785.
 5th. 'Annie Laurie 3rd,' No. 27957.
 Dam, 'Annie Laurie 2nd,' No. 15588.
 6th. 'Scottie's White Wings,' No. 24266.
 Dam, 'White Wings,' No. 9304.
 7th. 'Scottie's Victoria,' No. 23675.
 Dam, 'Victoria,' No. 13788.
 8th. 'Scottie's Dandy 2nd,' No. 25690.
 Dam, 'Dandy 1st of Brookside,' No. 13786.
 9th. 'Scottie's Victoria 2nd,' No. 21870.
 Dam, 'Victoria,' No. 13788.
 10th. 'Scottie's Sarah,' No. 21870.
 Dam, 'Sarah 2nd,' No. 13192.
 11th. 'Scottie's Nancy 2nd,' No. 27255.
 Dam, 'Nancy 2nd,' No. 19780.

No. 6. 'Rob Roy,' Reg. No. 14584.

Daughters qualified—

- 1st. 'Lady Menie,' No. 18727.
 Dam, 'Lady Ottawa,' No. 3001.
 2nd. 'Dewdrop of Menie,' No. 25875.
 Dam, 'Scotland's Best of Dentonia,' No. 13672.
 3rd. 'Lass O'Gowrie,' No. 25190.
 Dam, 'Jessie Blair Stewart of Menie,' No. 14549.
 4th. 'Lang Legget Kirsty,' No. 26541.
 Dam, 'Brownie of Menie,' No. 11632.

No. 7. 'Royal Star of Ste. Anne's,' Reg. No. 7916.

Daughters qualified—

- 1st. 'Star's Annie Laurie,' No. 21543.
 Dam, 'Annie Laurie of Norwich,' No. 17837.
 2nd. 'Star's Sarah,' No. 21541.
 Dam, 'Sarah 2nd,' No. 13192.

- 3rd. 'Spottie,' No. 18651.
Dam, 'Ada 3rd,' No. 18650.
- 4th. 'Star's Alpha,' No. 17839.
Dam, 'Daisy 1st of Brookside,' No. 13785

HOLSTEIN-FRIESIAN BULLS QUALIFIED FOR REGISTRATION.

No. 1. 'Victor DeKol Gretqui,' Reg. No. 3088.

Daughters qualified—

- 1st. 'Bell Tensen,' No. 6736.
Dam, 'Polly Tensen,' No. 2650.
- 2nd. 'Minnie Springbrook,' No. 6735.
Dam, 'Rosa Springbrook,' No. 5381.
- 3rd. 'Bessie DeKol Tensen,' No. 7852.
Dam, 'Jean Tensen,' No. 3425.
- 4th. 'Lucy Staple,' No. 7850.
Dam, 'Nettie Staple,' No. 3736.

No. 2. 'Lord Roberts DeKol,' Reg. No. 3597.

Daughters qualified—

- 1st. 'Pauline Texal,' No. 9646.
Dame, 'Bessie Texal Pietertje,' No. 9647
- 2nd. 'Helbon DeKol 2nd,' No. 8511.
Dam, 'Helbon DeKol,' No. 5631.
- 3rd. 'Belle Dewdrop 5th,' No. 8514.
Dam, 'Belle Dewdrop,' 4083.
- 4th. 'National Queen DeKol,' No. 10134.
Dam, 'Faultless Queen DeKol,' No. 5794.

No. 3. 'Count Echo DeKol,' Reg. No. 1465.

Daughters qualified—

- 1st. 'Rosa Lee DeKol,' No. 3127.
Dam, 'Rosa Lee,' No. 2360.
- 2nd. 'Jessie DeKol Echo,' No. 6295.
Dam, 'Jesse 2nd's Echo,' No. 2213.
- 3rd. 'Rosa Omega,' No. 3490.
Dam, 'Rosa,' No. 742.
- 4th. 'Sylvia,' No. 7765.
Dam, 'Lady Inka DeKol,' No. 4810.
- 5th. 'May Echo,' No. 2372.
Dam, 'Rosa May,' No. 2235.

No. 4. 'Count Mercena Posch,' Reg. No. 3902.

Daughters qualified—

- 1st. 'Lady Faforit Posch,' No. 8949.
Dam, 'Faforit 7th's Beauty,' No. 5077.
- 2nd. 'Bessie DeKol of Niagara,' No. 9354.
Dam, 'Bessie DeKol of Whittaker,' No. 6954.
- 3rd. 'Niagara Maid,' No. 9353.
Dam, 'Ferndale Maid,' No. 6952.
- 4th. 'Cloverleaf Faforit Mercena,' No. 9147.
Dam, 'Faforit 10th's Beauty,' No. 5622.

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No. 5. 'Manor Korndyke Wayne,' Reg. No. 4203.

Daughters qualified—

- 1st. 'Korndyke Wayne DeKol,' No. 9609.
Dam, 'Amy Peep 3rd,' No. 5513.
- 2nd. 'Brooklands Korndyke Wayne,' No. 9517.
Dam, 'Brookland's Sadie,' No. 5514.
- 3rd. 'Korndyke Pauline DeKol 2nd,' No. 11573.
Dam, 'Pauline Aaggie DeKol 2nd,' No. 5889.
- 4th. 'Aaggie DeKol,' No. 7928.
Dam, 'Pauline Aaggie DeKol,' No. 3688.

AYRSHIRE—COWS FIVE YEARS OLD AND OVER.

R. of F.	Name.	Reg. No.	Lbs. Milk.	Lbs. Fat.	Per cent of Fat in Milk.	Owner.	Address.
1	Almeda of Danville.....	15282	11,357·	409·9	3·60	365 G. A. Langelier...	Cap Rouge, Que.
3	Lady Stewart.....	11055	9,015·25	344·6	3·83	313 Alex. Hume.....	Menie, Ont.
5	Mitile.....	11529	10,202·	375·3	3·67	365 G. A. Langelier...	Cap Rouge, Que.
6	Lady Isabel.....	7467	8,884·	339·2	3·76	344 J. N. Greenshields	Danville, Que.
7	Miss Sandilands.....	8334	8,579·75	312·5	3·75	340 " "	" "
8	Winona of Brookhill.....	7479	9,843·	371·	3·77	365 " "	" "
11	Nellie Burns of Burnside.....	13317	8,722·25	320·5	3·66	275 R. R. Ness.....	Howick, Que.
12	Bargenoch Heather Bell.....	21366	8,548·25	314·9	3·66	332 " "	" "
17	Lady Pearl of Burnside.....	13467	9,226·25	328·34	3·56	287 " "	" "
21	Matchless Beauty of Netherlea.....	19601	8,845·	322·42	3·65	365 G. A. Langelier...	Cap Rouge, Que.
22	Daisy of Carlheim.....	11548	12,297·	383·4	3·15	360 J. N. Greenshields	Danville, Que.
27	Chapleton Swaney.....	25330	8,599·25	366·9	4·26	355 H. Gordon.....	Howick, Que.
29	Daisy Queen.....	9705	13,158·3	425·4	3·68	365 E. Cohoon.....	Harrietsville, Ont.
31	Trixy.....	9707	11,222·4	445·26	3·97	365 " "	" "
33	Dolly Dutton of Ste. Anne.....	10005	10,424·5	449·34	4·23	350 A. C. Wells & Son	Sardis, B. C.
41	Kirsty 2nd of Neidpath.....	10125	9,521·2	381·9	4·00	344 W. W. Ballantyne	Stratford, Ont.
42	Bertie of Springhill.....	8736	10,448·25	382·26	3·66	322 R. Hunter & Sons	Maxville, Ont.
43	Little Queen 2nd.....	9239	9,397·	375·44	4·00	370 A. C. Wells & Son	Sardis, B. C.
47	Barton Princess.....	9273	9,580·5	381·3	4·00	331 A. S. Turner.....	Ryckmans Corners, Ont.
49	Nellie Gray of Hickory Hill	15332	9,981·75	402·88	4·03	330 N. Dymont.....	Clappison, Ont.
50	Neidpath Rose 3rd.....	10126	9,037·5	367·4	4·06	354 W. W. Ballantyne	Stratford, Ont.
55	Burnside Brown Queen.....	27192	8,592·	353·9	4·10	369 G. A. Langelier...	Cap Rouge, Que.
59	White Heather.....	16978	9,501·5	363·5	3·82	297 J. Begg.....	St. Thomas, Ont.
60	Nellie's Jewel.....	76871	9,093·5	394·6	4·34	276 " "	" "
70	Primrose of Tanglewyld.....	15943	13,536·	529·	3·90	356 Wooddisse Bros...	Rothsay, Ont.
75	Dairymaid.....	13847	8,629·5	378·12	4·38	303 H. C. Hamill.....	Box Grove, Ont.
76	Scotland's Princess 2nd.....	16·83	10,182·75	461·02	4·53	365 A. S. Turner.....	Ryckmans Cor., O.
78	Myrtle.....	12274	9,943·8	328·19	3·30	305 E. Cohoon.....	Harrietsville, Ont.
81	Marjorie.....	16535	10,783·75	461·26	4·28	324 Dir. Exp. Farms.	Ottawa, Ont.
83	Annie Laurie 2nd.....	15588	15,134·4	598·45	3·95	365 E. Cohoon.....	Harrietsville, Ont.
85	Marica.....	15136	11,428·	418·37	3·66	365 Hon. W. Owens	Montebello, Que.
94	Margie of Culcaigrie.....	14388	8,620·	323·16	3·75	314 Dir. Exp. Farms.	Ottawa, Ont.
97	Nellie Gray of Hickory Hill	15332	12,040·2	469·92	3·90	365 N. Dymont.....	Rural Route No. 2, Hamilton, Ont.
102	Highland Lass.....	12013	8,622·	346·87	4·13	358 Alex. Hume & Co.	Menie, Ont.
105	Annie Hume of Ingleside.....	20473	8,829·5	342·78	3·88	314 H. C. Hamill.....	Box Grove, Ont.
110	Eileen.....	18220	11,025·75	522·94	4·74	365 G. D. Mode.....	Vankleek Hill, O.
111	Duchess of Point Round.....	17569	10,599·5	485·199	4·57	345 " "	" "
115	Victoria.....	13788	11,283·21	451·902	4·00	330 John McKee.....	Norwich, Ont.
126	Spottie.....	18651	9,517·	368·79	3·88	300 " "	" "
128	Little Gem of Elm Shade.....	18882	9,285·5	379·122	4·08	335 P. D. McArthur...	North Georgetown, Que.
132	Primrose of Tanglewyld.....	15943	16,195·5	625·62	3·86	365 Wooddisse Bros...	Rothsay, Ont.
134	Sarah 2nd.....	13192	11,626·2	442·35	3·80	358 John McKee.....	Norwich, Ont.
135	Duchess of Rockton.....	19695	9,981·46	375·58	3·88	365 N. Dymont.....	Rural Route No. 1, Hamilton, Ont.
141	White-Craig of Auchenbrain	16717	8,821·25	313·453	3·55	305 Macdonald College	Macdonald College, Que.
143	Kirsty 3rd of Neidpath.....	14559	11,903·5	388·54	3·26	365 W. W. Ballantyne	Stratford, Ont.
149	Lizzie Glen of Ste. Annes.....	16147	9,116·	365·29	4·00	333 Macdonald College	Macdonald Col., Q.
152	Pet of Hickory Hill.....	21259	13,191·	542·18	4·10	354 N. Dymont.....	Clappison, Ont.
153	Flower of Metcalfe.....	30405	9,157·45	368·70	4·02	276 A. S. Turner & Son	Ryckman's Corners, Ont.
154	Flora of Metcalfe.....	30257	11,908·85	427·34	3·59	365 " "	" "
155	Brownie.....	13188	8,730·6	362·31	4·15	330 John McKee.....	Norwich, Ont.
156	Lady Cairn.....	14428	9,051·35	322·25	3·55	307 Wm. Thorn.....	Lynedock, Ont.
159	May Beauty.....	12400	9,580	372·24	3·88	321 Wm. Stewart & Son	Menie, Ont.
164	Mabel.....	12768	8,872·75	342·90	3·86	365 Jas. Begg.....	St. Thomas, Ont.
171	Dairymaid.....	13847	8,968·	333·97	3·72	321 H. C. Hamill.....	Box Grove, Ont.
172	Sarah of Brookside.....	17842	9,711·	388·88	4·00	314 John McKee.....	Norwich, Ont.
173	Annie of Warkworth.....	21493	9,383·5	390·99	4·16	275 Alex. Hume & Co.	Menie, Ont.
176	Daisy 1st of Brookside.....	13785	8,533·2	353·00	4·14	284 John McKee.....	Norwich, Ont.
182	Daisy 4th of Neidpath.....	17937	9,889·7	406·41	4·11	365 W. W. Ballantyne	Stratford, Ont.
187	Dairymaid.....	24702	11,100·	571·77	5·16	365 And. McRae & Sons	East Royalty, E. I.
190	Snowflake.....	19739	12,616·1	556·79	4·41	259 A. S. Turner & Son	Ryckman's Corners, Ont.

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COWS FIVE YEARS OLD AND OVER—*Concluded.*

R. of P.	Name.	Reg. No.	Lbs. Milk.	Lbs. Fat.	Per cent of Fat.	Days in Milk.	Owner.	Address.
195	Star's Alpha.....	17839	9,305·6	366·50	3·94	308	E. Cohoon.....	Harrietsville, Ont.
202	Buttercup	24187	10,623·	382·79	3·60	283	W. J. Carlyle....	Chesterville, Ont.
205	Eileen.....	18220	13,825·75	635·48	4·59	365	G. D. Mode.....	Vankleek Hill, Ont.
206	Sybella of Springbank	27691	11,468·8	428·68	3·74	307	A. S. Turner & Son	Ryckman's Corners, Ont.
207	Alice of Kerwood.....	30387	10,030·7	396·36	3·95	283	"	"
211	Wexford Blood.....	16730	9,719·50	402·75	4·1	337	Macdonald Col. Q.	Macdonald Col. Q.
212	Rose of Senneville.....	20376	10,144·5	394·28	3·82	356	G. H. Montgomery	Philipsburg, Q.

COWS FOUR YEARS OLD AND UNDER FIVE.

48	Snowflake of Hickory Hill.	23481	9,182·05	362·4	3·95	365	N. Dymont.....	R.R. No. 2 Hamilton, Ont.
52	Lady Menie.....	18727	8,005·	297·8	3·72	364	Wm. Stewart & Son	Menie, Ont.
72	Bonnie Doon.....	19437	9,357·	40·36	4·28	355	Wooddisse Bros....	Rothsay, Ont.
74	Molly.....	27600	11,268·6	372·42	3·35	296	E. Cohoon.....	Harrietsville, Ont.
80	Ethel Belle.....	21349	9,258·	385·66	4·13	350	J. Beggs.....	St. Thomas, Ont.
82	Lassie of the Highlands.....	21491	9,309·1	410·54	4·41	350	F. H. Harris.....	Mt. Elgin, Ont.
84	Lily of the Valley	20300	8,028·37	333·55	4·16	327	Alex. Hume & Co.	Menie, Ont.
88	Clio of the Willows	20934	8,614·	330·67	3·84	244	W. Brown.....	Howick, Que.
92	Glenhamrock Cauty Again	24826	7,531·75	310·62	4·11	344	A. Hume & Co.....	Menie, Ont.
106	Peach of Ingleside.....	24330	7,590·	296·037	3·90	281	H. C. Hamill.....	Box Grove, Ont.
119	Buttercup of Ingleside.....	20476	9,138·75	372·04	4·07	364	"	"
121	Lessneswick Hopeful Rosie.	24728	8,235·	349·99	4·20	297	R. Hunter & Sons.	Maxville, Ont.
122	Kilboscow of Glenhurst.....	25026	7,690·25	322·87	4·20	334	"	"
129	Mary 1st., of St. Annes	22156	8,384·25	326·14	3·88	365	Macdonald College	Macdonald Coll. Q.
133	Ruth.....	23578	10,152·25	378·	3·72	327	Wooddisse Bros....	Rothsay, Ont.
147	Julia.....	23580	9,753·25	470·31	4·82	365	"	"
150	Daisy.....	23582	8,679·	367·93	4·24	300	"	"
151	Maud of Hillview.....	23671	9,028·00	333·5	3·69	327	W. J. Carlyle....	Chesterville, Ont.
180	Scotland Princess 2nd.....	23495	11,385·95	511·97	4·48	565	A. S. Turner.....	Ryckman's Corners, Ont.
199	Scottie's Sarah.....	21870	9,364·6	348·04	3·7	280	John McKee.....	Norwich, Ont.
200	Guy's Red Rose 2nd.....	29792	9,043·8	409·16	4·52	355	A. H. Trimble & Sons.	Red Deer, Alta.
201	Rena.....	28709	8,711·	332·53	3·8	270	W. J. Carlyle....	Chesterville, Ont.
210	Kirsty of Ste. Annes	25968	9,150·75	334·43	3·65	358	Macdonald College	Macdonald Col. Q.

COWS THREE YEARS OLD AND UNDER FOUR.

15	Jubilee of Hickory Hill....	23480	7,343·	320·22	4·36	263	N. Dymont.....	Clappison, Ont.
20	Rosalie of Hickory Hill....	23482	7,935·7	350·	4·41	365	"	"
23	Pinkrose of Hickory Hill....	15333	8,556·4	378·03	4·41	355	"	"
24	Norena.....	19391	7,142·75	282·02	3·94	350	W. D. Parker.....	Hatley, Que.
40	Woodroffe Lady Nancy.....	21454	7,197·5	303·91	4·22	302	A. C. Wells & Son.	Sardis, B.C.
44	Isalodge Nancy 1st.....	20525	8,184·	316·16	3·86	288	J. N. Greenshields.	Danville, Que.
45	Beauly of Shannon Bank.....	23519	7,677·	354·47	4·62	327	W. H. Tran.....	Cedar Grove, Ont.
58	Miss Orlia.....	20098	7,158·	433·33	4·65	365	G. A. Langelier....	Cap Rouge, Que.
64	Canadian Princess.....	20108	11,377·55	521·91	4·59	335	A. S. Turner.....	Ryckmans Cor., O.
67	Dairy Queen of Springhill....	23743	8,023·75	331·85	4·13	324	R. Hunter & Sons.	Maxville, Ont.
68	Shannon Bank Frances 2nd	23520	3,133·	330·32	3·94	361	W. H. Tran.....	Cedar Grove, Ont.
71	Ruth.....	2·578	7,591·5	276·65	3·64	365	Wooddisse Bros....	Rothsay, Ont.
73	Daisy.....	23582	7,554·	334·88	4·48	330	"	"
77	Star's Annie Laurie.....	21543	8,230·3	330·87	4·02	319	E. Cohoon.....	Harrietsville, Ont.
86	Julia.....	23580	8,062·5	377·33	4·68	339	Wooddisse Bros....	Rothsay, Ont.
93	Denty 4th of Ottawa.....	25269	6,942·5	312·2	4·50	341	Dir. Experi. Farms	Ottawa, Ont.
96	Forget-me-not of Hickory Hill.	27661	7,578·8	309·05	4·08	365	N. Dymont.....	Rural Route No. 2, Hamilton, Ont.
107	Clarice of Ravensdale.....	22271	7,279·75	294·72	4·048	346	W. F. Kay.....	Philipsburg, Que.
113	White Legged Kirsty.....	21958	9,526·6	359·27	3·77	365	Frank H. Harris....	Mt. Elgin, Ont.
117	Star's Sarah.....	21541	10,651·94	407·4	3·82	365	John McKee.....	Norwich, Ont.
118	Briery of Springbank.....	29616	10,172·9	376·63	3·70	325	A. S. Turner & Son	Ryckman's Cor. O.
130	Snowdrop of Hickory Hill....	23599	8,527·2	345·97	4·05	365	N. Dymont.....	Rural Route No. 2, Hamilton, Ont.

COWS, THREE YEARS OLD AND UNDER FOUR—*Concluded.*

R. of P.	Name.	Reg. No.	Lbs. Milk.	Lbs. Fat.	Per cent of Fat.	Days in Milk.	Owner.	Address.
138	Ethel of Stockwell.....	29638	8,861.25	355.18	4.00	338	Hon. W. Owens ..	Montebello, Que.
140	Maud of Ste. Annes.....	25979	7,828.75	286.84	3.66	342	Macdonald College	Macdonald Col., Q.
145	Flavia 2nd of Ottawa.....	22197	8,413.5	348.53	4.14	331	Dir. Exp. Farins...	Ottawa, Ont.
148	Madge.....	27700	7,271.	333.24	4.58	320	Wooddise Bros ..	Rothsay, Ont.
160	Dewdrop of Menie.....	25875	9,783.	401.46	4.10	295	Wm. Stewart & Son	Menie, Ont.
161	Lass O'Gowrie.....	25190	6,896.5	279.16	4.04	333	"	"
163	Stony Croft Lady Helen.....	25225	8,602.	258.96	4.17	302	Alex. Hume & Co..	"
166	Flower of Sardis.....	26539	6,760.25	247.52	3.66	323	Jos. Thompson.....	Sardis, B.C.
174	Dairy Miss.....	24722	7,631.	318.21	4.17	365	And. McRae.....	East Royalty, P. E. I.
177	Coquette of Lakeside.....	26685	7,609.5	303.18	3.97	350	G. H. Montgomery	Phillipsburg, Que.
178	Barcheskie Derby 6th.....	28548	7,206.	296.22	4.10	337	"	"
181	Grace.....	27602	7,721.9	301.85	3.9	302	A. S. Turner & Son	Ryckman's Corn- ers, Ont.
183	Scottie's Victoria.....	23675	10,057.5	389.56	3.87	314	John McKee.....	Norwich, Ont.
186	Scottie's Dandy 2nd.....	25690	7,317.9	289.78	3.96	293	"	"
189	Jemima of Springbank 2nd.....	29618	8,265.05	311.99	3.77	243	A. S. Turner & Son	Ryckman's Corn- ers, Ont.
194	College Merry Maid.....	28776	8,371.75	321.62	3.08	365	N.S. Agric. College	Truro, N.S.
197	Lady Minto 2nd.....	24159	7,716.6	321.01	4.16	290	W. J. Carlyle.....	Chesterville, Ont.
198	Oddity.....	27699	9,030.25	383.62	4.24	365	Wooddise Bros ..	Rothsay, Ont.
204	Mabel of Riverside.....	26320	9,432.	375.54	3.98	365	G. D. Mode.....	Vankleek Hill, Ont.

COWS, TWO YEARS OLD AND UNDER THREE.

2	Lady Clare of Burnside.....	22293	7,959.75	307.8	3.87	299	R. R. Ness	Howick, Que.
4	Archieskie Lucky Girl.....	21363	8,710.25	350.08	4.00	313	"	"
9	Susie of Hickory Hill.....	22336	6,410.	302.14	4.71	335	N. Dymont.....	Clappison, Ont.
10	Monkland Dorothy.....	21370	6,046.75	245.38	4.07	292	R. R. Ness	Howick, Que.
13	Minnie of Elm Shade.....	18883	7,533.5	238.23	3.76	290	H. Gordon.....	"
14	Finlayson Rose.....	21369	7,163.	285.15	3.98	335	R. R. Ness	"
16	Barcheskie Sybil.....	25326	6,080.	270.9	4.15	296	H. Gordon.....	"
18	Isaleigh Nancy 1st.....	20525	7,439.	276.1	3.71	341	J. N. Greenshields.	Danville, Que.
19	Stadacona Lily.....	19257	6,228.	236.27	3.79	300	G. A. Langelier...	Cap Rouge, Que.
25	Sunnymead Princess.....	19360	6,748.	295.16	4.37	360	W. D. Parker.....	Hatley, Que.
26	Adalia 2nd.....	22949	9,924.	366.97	3.70	365	E. Cohoon.....	Harrietsville, Ont.
28	Isaleigh Claribella 2nd.....	28712	8,454.75	322.55	3.80	365	J. N. Greenshields.	Danville, Que.
30	Lady Brant of Neidpath.....	21463	6,631.	303.99	4.58	319	W. W. Ballantyne.	Stratford, Ont.
31	Daisy Queen 2nd.....	22950	6,644.6	250.18	3.76	345	E. Cohoon.....	Harrietsville, Ont.
32	Stadacona Silver Queen.....	20043	6,373.	303.38	4.76	340	G. A. Langelier...	Cap Rouge, Que.
34	Annie of Warkworth.....	21493	6,689.25	284.49	4.25	365	Alex. Hume.....	Menie, Ont.
35	Adalia 3rd.....	22948	8,845.55	326.46	3.69	365	E. Cohoon.....	Harrietsville, Ont.
36	Rosebud.....	22305	7,982.5	280.1	3.51	365	Jos. Thompson.....	Sardis, B.C.
37	Ruby Royal of the Hills.....	23373	6,615.5	276.45	4.24	365	A. C. Wells & Son.	"
39	Dolly Dutton of Ste. Anne's 2nd.....	23374	6,290.	287.72	4.57	334	"	"
46	Bessie 16th of Neidpath.....	21468	7,625.	330.72	4.34	358	W. W. Ballantyne.	Stratford, Ont.
51	Neidpath Rose 10th.....	21459	6,442.2	295.99	4.60	355	"	"
53	Daisy of Westland.....	27199	6,950.	316.77	4.55	355	G. A. Langelier...	Cap Rouge, Que.
54	Scotia Jean.....	24130	5,850.25	244.98	4.16	335	W. W. Bowley.....	Napperton, Ont.
56	Ardyne Carnytne.....	26349	7,019.75	312.93	4.45	365	R. Hunter & Sons.	Maxville, Ont.
57	Auchenbrain White Rose.....	26348	6,618.	278.82	4.21	363	"	"
61	Madeline B.....	23601	7,135.5	292.96	4.10	365	Jas. Begg.....	St. Thomas, Ont.
62	Sybella of Springbrook.....	27691	7,305.9	302.24	4.13	226	A. S. Turner.....	Ryckman's Cor., Ont.
63	Princess.....	23581	6,778.75	292.	4.30	365	Wooddise Bros.....	Rothsay, Ont.
65	Jemima of Springbank.....	27689	8,889.5	395.33	4.47	338	A. S. Turner.....	Ryckman's Cor., Ont.
66	Isaleigh Miss Sandy.....	23827	6,744.	288.75	4.28	365	G. A. Langelier...	Cap Rouge, Que.
69	Lucy 4th.....	25101	5,782.	259.29	4.50	329	W. H. Tran.....	Cedar Grove, Ont.
79	Hot Scotch Lassie.....	23704	6,066.	258.61	4.26	328	F. H. Harris.....	Mt. Elgin, Ont.
87	Madge.....	27700	6,663.75	301.6	4.52	346	Wooddise Bros.....	Rothsay, Ont.
99	Bessie 18th of Neidpath.....	24610	6,461.1	293.5	4.57	352	W. W. Ballantyne.	Stratford, Ont.
90	Lady Betty.....	23604	7,182.	302.71	4.21	365	James Begg.....	St. Thomas, Ont.
91	Bonny.....	24357	7,288.	322.79	4.43	365	"	"
95	Beauty of Hickory Hill.....	27663	7,397.75	281.54	3.70	358	N. Dymont.....	Rural Route No. 2, Hamilton, Ont.

SESSIONAL PAPER No. 15b

COWS, TWO YEARS OLD AND UNDER THREE—*Concluded.*

R. & P.	Name.	Reg. No.	Lbs. Milk.	Lbs. Fat.	Per cent. of Fat.	Days in Milk.	Owner.	Address.
98	Clara of Hillview.....	24460	6,844.5	275.36	4.02	365	W. L. Center.....	Innisfail, Alta.
99	Laura Belle.....	27772	6,001.5	238.77	3.98	365	"	"
100	Southwick Lily 5th.....	28539	5,662.25	248.34	4.38	365	Geo. Hay.....	Howick, Que.
101	Southwick Kirsty 8th.....	28538	5,833.5	229	3.92	365	"	"
103	Prim of the Willows.....	26879	6,104.5	237.24	3.88	337	P. D. McArthur.....	North " Georgetown, Que.
104	Prima Dona.....	24434	7,191.7	284.67	3.96	334	Frank H. Harris..	Mt. Elgin, Ont.
108	Stonehouse Pansy 3rd.....	25309	6,833	262.31	3.83	365	Jos. Thompson....	Sardis, B.C.
109	Rosebud's Gem.....	26533	7,040.5	265.42	3.77	299	"	"
112	Oddity.....	27698	7,222.25	297.56	4.12	365	Wooddise Bros....	Rothsay, Ont.
114	Minnie of Hillcrest.....	27745	6,450.6	279.85	4.34	338	Frank H. Harris..	Mt. Elgin, Ont.
116	Scottie's Nancy.....	24265	6,501.17	269.15	4.14	320	John McKee.....	Norwich, Ont.
120	Snowflake of Spring Brook.....	23750	6,315.75	266.42	4.37	285	G. D. Mode.....	Vankleek Hill, Ont.
123	Barcheskie Winflower.....	28533	6,065.35	261.16	4.30	333	George Hay.....	Howick, Que.
124	Speck of Springbank.....	29619	10,353.65	437.39	4.20	365	A. S. Turner & Son	Ryckman's Cor., Ont.
125	Scottie's Lassie.....	24264	6,771.2	234.41	3.46	339	John McKee.....	Norwich, Ont.
127	Ruby of Springbank.....	29622	9,368.85	384.77	4.10	337	A. S. Turner & Son	Ryckman's Cor., Ont.
131	Peggy Murphy.....	27352	7,875.7	274.28	3.48	325	John McKee.....	Norwich, Ont.
136	Neidpath Rose 13th.....	27620	6,630.5	294.62	4.45	365	W. W. Ballantyne.	Stratford, Ont.
137	Burnside Lucky Girl 2nd.....	30847	8,408.75	305.28	3.63	365	R. R. Ness.....	Howick, Que.
139	Maud 2nd of Ste. Annes.....	27297	7,019.5	282.53	4.02	320	Macdonald College	Macdonald Col'ge, Que.
142	Annie Laurie 3rd.....	27957	7,728.6	284.93	3.68	365	W. W. Ballantyne.	Stratford, Ont.
144	Scottie's White Wings.....	24266	6,933.7	247.38	3.56	328	H. & J. McKee...	Norwich, Ont.
146	Ottawa Kate.....	29601	9,017	339.45	3.76	365	Dir. Exp. Farms..	Ottawa, Ont.
157	Holehouse Flirt of Trout Run.....	27033	10,298.5	433.72	4.21	365	Wm. Thorn.....	Lynedock, Ont.
158	Lessnessock Sprightly.....	26345	7,405	260.35	3.51	322	Alex. Hume & Co.	Menie, Ont.
162	Milkmaid 7th.....	23769	11,673.5	492.75	4.22	365	And. McRae.....	East Royalty, P. E. I.
165	Lang Legget Kirsty.....	26541	6,602	265.18	4.16	345	Wm. Stewart & Son	Menie, Ont.
167	Fairview Lassie.....	26531	10,464	331.74	3.65	353	Jos. Thompson...	Sardis, B.C.
168	Fairview Nora.....	26532	6,972.5	265.91	3.95	313	"	"
169	New Year.....	29577	7,445.5	350.10	4.7	365	Wooddise Bros....	Rothsay, Ont.
170	Nola of Craigielea.....	29803	6,092.25	247.20	4.05	337	H. C. Hamill.....	Box Grove, Ont.
175	Mollie Bawn.....	28376	5,910.75	236.30	4.00	365	And. McRae & Sons	East Royalty, P. E. I.
179	Ayrshire Beauty of Trout Run.....	27034	8,008.45	313.24	3.91	365	Wm. Thorn.....	Lynedock, Ont.
184	Burnside Pearl 4th.....	27181	6,471	254.41	3.93	292	R. R. Ness.....	Howick, Que.
185	Burnside Silver Bell.....	31664	6,487.75	262.62	4.04	287	"	"
188	Helena of Springbank.....	30215	6,764.55	278.01	4.11	289	A. S. Turner & Son.	Ryckman's Corners, Ont.
191	Lessnessock Queen Bee.....	30581	6,163	243.44	3.94	303	Robt. Hunter & Son	Maxville, Ont.
192	Scottie's Victoria 2nd.....	25906	8,359.9	322.82	3.86	365	John McKee.....	Norwich, Ont.
193	Ravensdale Flirt.....	26652	6,672	257.47	3.85	317	W. F. Kay.....	Philipsburg, Que.
196	Christmas Belle.....	25958	7,634.9	265.67	3.46	330	E. Cohoon.....	Harrietsville, Ont.
203	Scottie's Nancy 2nd.....	27253	8,387.4	343.56	4.10	295	John McKee.....	Norwich, Ont.
208	Briery 2nd of Springbank.....	32137	14,131.35	520.49	3.63	365	A. S. Turner & Son.	Ryckman's Corners, Ont.
209	Butter Maid of Craigielea.....	29940	11,392.45	480.33	4.21	365	"	"
213	Queen of Meadowvale.....	26982	6,176.75	237.55	3.84	362	N.S. Agric. College	Truro, N.S.

3 GEORGE V., A. 1913

FRENCH CANADIAN—COWS FIVE YEARS OLD AND OVER.

R. of P.	Name.	Reg. No.	Lbs. Milk.	Lbs. Fat.	Per cent of Fat.	Days in Milk.	Owner,	Address.
1	Fancy.....	6252	7,425.75	318.8	4.30	334	T. B. Macaulay...	Hudson Heights, Q
4	Fortune.....	757	7,158.25	330.48	4.61	302	" "	" "
5	Reine 2 ^e me.....	1319	8,607.5	312.66	3.63	276	Sylvestre Frères...	Clairvaux, Que.
6	Caprera.....	1662	7,635.5	312.16	4.09	340	" "	" "
7	Inoquette.....	871	7,876.6	377.57	4.80	365	Director " Experi- mental Farms.	Ottawa, Ont.
9	La Poupée.....	875	6,963.	335.21	4.81	330	" "	" "
10	Zamora.....	242	7,668.	403.05	5.25	330	" "	" "
12	Lyster II.....	1235	7,887.	322.26	4.08	287	C. N. Lyster.....	Kirkdale, Que.

COWS FOUR YEARS OLD AND UNDER FIVE.

8	La Belle.....	869	7,196.	357.48	4.96	345	Director " Experi- mental Farms.	Ottawa, Ont.
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COWS THREE YEARS OLD AND UNDER FOUR.

13	Orange Blossom.....	886	6,192.25	308.79	4.98	291	T. B. Macaulay...	Hudson Heights, Q
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COWS TWO YEARS OLD AND UNDER THREE.

2	Garceau 3.....	6502	5,090.43	207.08	4.10	365	G. Garceau.....	Pointe du Lac, Que
3	Douarnenaise.....	1020	4,724.25	221.91	4.70	284	T. B. Macaulay...	Hudson Heights, Q
5	Orange Blossom.....	886	5,333.5	280.55	5.26	365	" "	" "
11	Alert.....	1243	6,618.95	276.58	4.18	305	C. N. Lyster.....	Kirkdale, Que.
14	Douarnenaise.....	1020	6,006.75	292.25	4.86	313	T. B. Macaulay...	Hudson Heights, Q
15	Winnie.....	1844	5,293.81	247.63	4.67	363	C. N. Lyster.....	Kirkdale, Que.
16	Jane.....	1843	4,977.69	230.26	4.62	365	" "	" "

GUERNSEY—COWS FIVE YEARS OLD AND OVER.

2	Lady Heiress of Dentonia..	325	8,925.	430.74	4.82	365	Howard W. Corn- ing.	Cheggoggin, N.S.
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CLASS FOUR YEARS OLD.

1	Dorothy's Heiress.....	120	8,085.5	495.74	6.13	365	Howard W. Corn- ing.	Cheggoggin, N.S.
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CLASS THREE YEARS OLD.

3	Beauty of Hillside.....	64	7,394.5	384.9	5.20	326	Howard W. Corn- ing.	Cheggoggin, N.S.
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CLASS TWO YEARS OLD.

4	Dairymaid of Hillside.....	125	9,352.	464.2	4.96	365	Howard W. Corn- ing.	Cheggoggin, N.S.
5	Buttercup of Hillside.....	217	7,056.5	394.35	5.58	365	Howard W. Corn- ing.	Cheggoggin, N.S.
6	Dona Clatina.....	172	6,096.5	333.53	5.47	360	Director " Experi- mental Farms...	Ottawa, Ont.
7	Dairy Queen of Hillside....	123	5,447.	291.15	5.34	319	Howard W. Corn- ing.	Cheggoggin, N.S.

SESSIONAL PAPER No. 15b

HOLSTEIN-FRIESIAN—COWS FIVE YEARS OLD AND OVER.

R. of P.	Name.	Reg. No.	Lbs. Milk.	Lbs. Fat.	Per cent of Fat.	Days in Milk.	Owner.	Address.
2	Madam Dot 3rd's Pauline DeKol.	3706	11,518.7	438.57	3.80	303	N. Sangster	Ormsdown, Que.
4	Dorliska Willis	4817	11,014.25	396.8	3.60	325	Geo. H. Caughell.	Aylmer, Ont.
5	Maggie Dorliska	7259	11,644.5	393.19	3.42	350	"	"
7	Malahide Princess	4615	10,621.75	402.7	3.80	350	"	"
8	Evergreen March	3896	15,239.25	556.7	3.65	305	G. W. Clemons	St. George, Ont.
14	Netherland Aaggie	2478	13,545.5	439.26	3.24	325	J. M. Van Patter	Luton, Ont.
18	Netherland Tensen	3423	15,023.5	473.62	3.15	365	A. E. Smith & Son	Millgrove, Ont.
21	Rosa Lee DeKol	3127	13,990.5	479.28	3.42	365	B. Mallory	Belleville, Ont.
22	Snowflake Queen DeKol of Minster.	4535	13,089.7	443.24	3.38	365	R. Honey	Brickley, Ont.
23	Sarah Jane 2nd	3604	11,428.5	426.54	3.73	364	W. J. Bailey	Nober, Ont.
31	Madam Dot 3rd's Pauline DeKol.	3706	12,734.1	487.23	3.82	365	N. Sangster	Ormsdown, Que.
33	Bontje Paul	2660	13,011.7	445.83	3.43	333	"	"
35	Vida Princess 3rd	2774	14,649.6	438.1	3.00	363	J. M. Van Patter	Luton, Ont.
36	Vida Princess 4th	2775	18,402.75	602.6	3.26	365	"	"
41	Netherland Aaggie DeKol.	6439	21,666.7	704.8	3.25	365	"	"
46	Lady Elgin A	4918	11,487.2	442.5	3.85	365	F. Leeson	Aylmer, Ont.
47	Edna Wallace	3505	16,367.8	542.6	3.31	365	"	"
57	Lilly Westwood 2nd	3966	11,593.3	370.7	3.19	323	Thos. Hartley	Downsview, Ont.
60	Bell DeKol Queen 2nd	3523	15,447.25	495.29	3.20	344	H. Bollert	Cassel, Ont.
63	Spotted DeKol Lady	8118	13,212.25	473.12	3.57	352	S. Lemon	Lynden, Ont.
64	Sevangeline 2nd	4340	10,655.5	373.1	3.50	300	"	"
69	Bertha Black	2327	15,224.27	530.7	3.48	327	Otto Subring	Sebringville, Ont.
72	Springbrook Queen	1302	11,565.18	363.7	3.14	360	S. Lemon	Lynden, Ont.
73	Counless Carrie Mercedes	8102	13,400.7	383.3	2.86	347	"	"
76	Trenton Pride	3491	12,792.4	378.61	2.96	332	B. Mallory	Belleville, Ont.
78	Rideau Della, Princess DeKol.	4612	15,069.7	464.33	3.08	305	C. Duff Nelles	Boston, Ont.
80	Shawasse Beauty 2nd	12157	13,694.3	400.36	3.21	565	H. Bollert	Cassel, Ont.
84	Rosa Belle B	2275	11,337.5	375.22	3.25	315	David McDonald	Trenton, Ont.
85	Carrie May	4179	11,689.5	369.61	3.16	365	F. E. Came	St. Lambert, Que.
86	Helbon Spink's Netherland Lass	2971	12,476.87	423.22	3.39	358	S. Lemon	Lynden, Ont.
87	Jossie Bewunde Posch	5281	15,439.5	463.81	3.00	365	E. Laidlaw & Sons	Aylmer West, Ont.
91	Fairy	4423	14,344.25	425.26	2.96	304	O. D. Bales	Lansing, Ont.
92	Hyacinth	3603	13,864.5	453.7	3.26	335	"	"
94	Centre View's Gem 2nd	5246	11,438.45	366.22	3.20	365	Robt. J. Miller	Fonthill, Ont.
96	Princess of Wellesley	3042	11,401.5	364.54	3.19	311	L. H. Lipsitt	Stratfordville, Ont.
99	DeKol Plus	10753	22,304.7	764.94	3.43	365	S. J. Foster	Bloomfield, Ont.
100	Rosa Calanity Clay A	4971	14,815.5	424.59	2.866	305	"	"
104	Erie Girl 2nd	5345	11,851.7	382.97	3.23	334	W. M. Gibson	Winnipeg, Man.
105	Nokomis	6692	13,156.8	427.86	3.25	365	W. J. Cowie	Locust Hill, Ont.
106	Kitty Marling DeKol	5676	13,529.6	441.39	3.26	357	N. Sangster	Ormsdown, Que.
110	Rosa Omega	3490	12,181.6	372.585	3.05	305	B. Mallory	Belleville, Ont.
111	Ruby A	1812	13,633.5	413.22	3.03	345	F. Leeson	Aylmer, Ont.
116	Helena Hengerveld DeKol.	4337	16,302.62	534.81	3.28	365	A. D. Foster	Bloomfield, Ont.
118	Maud Pessie DeKol	4334	15,240.75	433.74	2.84	365	S. M. Peacock	Mt. Salem, Ont.
122	Winnie Westwood	3568	11,210.1	364.09	3.25	291	Thos. Hartley	Downsview, Ont.
124	Gladiolus	4037	14,113.31	469.78	3.32	365	John McKenzie	Willowdale, Ont.
126	Mayfield Hilda	3343	13,006.65	451.19	3.44	345	W. J. Cowie	Locust Hill, Ont.
128	Tempest Clothilde Mercedes	5327	18,447.9	600.31	3.25	365	Thos. Hartley	Downsview, Ont.
129	Fanny Fern	2946	10,732.75	369.05	3.439	320	E. Laidlaw & Son	Aylmer West, Ont.
131	Flora Wayne of Riverside	2414	14,632.7	469.416	3.195	313	N. S. Agricultural College	Truro, N.S.
136	Ferndale Maid	6953	17,162.43	607.54	3.54	349	John Brown	Stamford, Ont.
139	Aaggie Mechlin	3561	13,190.75	415.86	3.15	343	N. S. Agricultural College	Truro, N.S.
141	Johanna Netherland DeKol	4290	16,687.95	548.88	3.29	365	Miss G. E. Peacock	Mt. Salem, Ont.
144	Beauty's Buffalo Girl	3562	16,820.9	554.86	3.30	305	Tig. Wood	Mitchell, Ont.
147	Lilly Westwood	3966	13,738.37	448.75	3.26	362	Thos. Hartley	Downsview, Ont.
150	Queen's Artis Peer	10200	12,609.9	398.62	3.24	342	Edgar Dennis	Newmarket, Ont.
151	Netherby Queen Jane	4336	12,318.1	444.15	3.60	228	S. G. Carlyle	Chesterville, Ont.
158	Aaggie DeKol Witzdye	6440	13,709.75	446.79	3.25	335	J. M. VanPatter	Aylmer, Ont.
166	Patsy 4th's Axie DeKol	9739	13,446.56	453.33	3.37	315	Thos. Hartley	Downsview, Ont.
172	Amy Peep 3rd	5513	13,007.05	471.89	3.46	365	J. W. McCormick	Morewood, Ont.

3 GEORGE V., A. 1913

, COWS, FIVE YEARS OLD AND OVER—Concluded.

R. of P.	Name.	Reg. No.	Lbs. Milk.	Lbs. Fat.	Per cent. of Fat.	Days in Milk.	Owner.	Address.
174	Georgie.....	5742	12,299-27	393-74	3-21	341	J. B. Arnold.....	Easton's Corners, Ont.
175	May DeKol Queen.....	4343	13,588-05	445-66	3-23	363	"	"
176	Rooker's Jongste Tensen.....	4075	12,950-25	414-04	3-19	365	R. Honey.....	Brickley, Ont.
180	Hengerveld Docia.....	5512	10,708-56	397-52	3-72	330	J. W. McCormick.	Moorewood, Ont.
186	Mercedes Jewel.....	6219	11,751-4	382-79	3-25	287	Monro & Lawless..	Thorold, Ont.
188	Rose of Alnwick.....	4435	12,639-6	399-8	3-16	365	J. S. Honey.....	Cherrywood, Ont.
189	Helena Pietertje's Pauline.....	4374	17,555-62	534-48	3-04	337	S. J. Foster.....	Bloomfield, Ont.
191	Sadie Queen.....	4300	13,395-25	439-10	3-27	322	"	"
196	Jean F. DeKol.....	5480	15,654-6	523-64	3-34	362	S. G. Carlyle.....	Chesterville, Ont.
198	Kate Castleton.....	4512	18,713-5	580-58	3-10	365	F. S. Passmore.....	Brantford, Ont.
203	May Echo.....	3372	23,707	833-64	3-51	367	F. R. Mallory.....	Frankford, Ont.
209	Pauline Aaggie DeKol II.....	5839	11,647-43	436-8	3-7	357	J. W. McCormick.	Moorewood, Ont.
215	Alice Neilson.....	4222	10,731-18	361-17	3-37	300	S. Lemon.....	Lynden, Ont.
216	Sevangeline 2nd.....	4340	11,362-7	436-59	3-8	313	"	"

COWS FOUR YEARS OLD AND UNDER FIVE.

1	Rhoda's Queen ..	4832	12,597-9	422-76	3-55	270	N. Sangster ..	Ormsdown, Que.
9	Ruth Tensen DeKol.....	6940	13,289-	407-13	3-06	320	A. E. Smith & Son	Millgrove, Ont.
16	Lucretia Borgia.....	4432	10,697-25	419-73	3-92	313	G. W. Clemons...	St. George, Ont.
19	Glenside Nerissa.....	5395	12,459-4	397-6	3-19	342	G. H. McKenzie...	Thornhill, Ont.
20	Glenside Laura.....	5304	11,651-2	341-21	2-93	335	"	"
40	Johanna Netherland De-Kol.....	4290	14,043-25	473-81	3-37	340	Miss G. E. Peacock	Mt. Salem, Ont.
45	Vera H.....	4999	14,107-5	464-	3-29	365	F. Leeson.....	Aylmer, Ont.
54	Lulu Glaser.....	5069	12,499-98	468-17	3-70	260	S. Lemon.....	Lynden, Ont.
56	May Echo Pietertje.....	4606	11,720-5	358-25	3-06	335	B. Mallory.....	Belleville, Ont.
59	Lina Netherland Abbekerk.....	12158	12,773-31	419-78	3-23	288	H. Bollert.....	Cassel, Ont.
77	Daisy Verbelles.....	5079	12,268-3	412-29	3-36	360	B. Mallory.....	Belleville, Ont.
81	Jessie Inka Keyes.....	6231	12,860-5	417-73	3-24	362	A. A. Caskey.....	Madoc, Ont.
83	Betsy's Pearl.....	5733	16,759-	504-39	3-00	330	A. A. Johnston...	Stratfordville, Ont.
112	Daisy Pietertje Johanna.....	6190	14,237-16	523-75	3-67	348	D. C. Flatt & Son.	Millgrove, Ont.
113	Faforit 10th's Beauty.....	5622	13,397-	417-59	3-13	365	A. E. Smith & Son.	"
121	Daisy Jane.....	9057	12,828-	455-23	3-55	295	Thos. Hartley.....	Downsview, Ont.
123	Prokula DeKol.....	6635	12,550-8	413-36	3-30	303	Tig. Wood.....	Mitchell, Ont.
134	Pearl's Lady Acme.....	5725	11,789-5	353-32	3-04	365	R. O. Morrow.....	Hilton, Ont.
149	Queen Netherland Peer.....	10201	15,253-8	447-08	2-93	361	Edgar Dennis.....	Newmarket, Ont.
156	Winnie R. Calamity Posch.....	7221	14,324-	471-319	3-29	365	E. E. Osler.....	Bronte, Ont.
162	Irene Fairmont.....	6858	13,650-36	420-56	3-07	335	F. I. Burrill.....	Holbrook, Ont.
165	Bess DeKol.....	6733	14,101-75	435-37	3-08	285	John C. Brown...	Stamford, Ont.
185	Julia Posch Abbekerk.....	7911	11,241-2	377-09	3-35	323	Monro & Lawless..	Thorold, Ont.
185	Agatha Houwtje DeKol.....	7968	12,576-8	406-61	3-25	365	"	"
190	Daisy Pauline Pietertje.....	7042	15,158-02	494-8	3-19	306	S. J. Foster.....	Bloomfield, Ont.
200	Nellie's Pet.....	7489	12,677-	421-03	3-32	289	Tig. Wood.....	Mitchell, Ont.
206	Aaggie DeKol.....	7928	13,119-37	513-54	3-91	358	J. W. McCormick.	Moorewood, Ont.
212	Fancy B. Posch.....	8428	10,403-06	411-32	3-9	275	Richard Clark...	Henfryn, Ont.
220	Tillie Acema.....	6775	12,666-6	429-3	3-33	365	H. J. Allison.....	Chesterville, Ont.
221	Quora 4th.....	6372	14,850-	447-87	3-01	328	"	"
222	Rideau Pietertje DeKol.....	8394	12,144-1	395-55	3-25	303	C. Duff Nelles.....	Boston, Ont.
229	Princess Netherland Pride.....	17025	11,758-25	406-42	3-45	337	J. W. McCormick.	Moorewood, Ont.
232	Fanny Isoco Pride.....	7686	12,273-8	419-7	3-41	362	Thos. Hartley....	Downsview, Ont.

COWS THREE YEARS OLD AND UNDER FOUR.

10	Bonnie Tensen ..	5818	13,215-5	436-5	3-30	365	O. D. Bales ..	Lansing, Ont.
11	Helbon DeKol ..	5631	16,346-	568-47	3-48	365	E. Laidlaw & Sons	Aylmer, Ont.
25	May Echo Verbelles.....	5320	10,867-	345-7	3-18	322	B. Mallory.....	Belleville, Ont.
41	Verona.....	6419	10,080-1	310-27	3-07	322	N. Sangster.....	Ormsdown, Que.
42	Faforit Butter Girl.....	5970	13,272-3	428-3	3-22	342	Thos. Hartley.....	Downsview, Ont.
43	Nierop Netherland Bess 2d.....	6934	13,052-8	434-14	3-32	360	"	"
50	Sherwood Edna's Faforit ..	6199	12,695-25	394-73	3-13	365	C. H. Shaver.....	Davisville, Ont.
55	Julia Arthur 2nd.....	6977	9,019-	312-17	3-46	365	G. W. Clemons...	St. George, Ont.
61	Maple Grove Belle 2nd.....	6540	12,594-47	419-02	3-33	330	H. Bollert.....	Cassel, Ont.
62	Luella Tensen ..	8456	13,504-6	374-09	2-77	336	S. Lemon.....	Lynden, Ont.

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COWS, THREE YEARS OLD AND UNDER FOUR—*Concluded.*

R. of P.	Name.	Reg. No.	Lbs. Milk.	Lbs. Fat.	Per cent of Fat.	Days in Milk.	Owner.	Address.
66	Seymour Mechthilde DeKol	5974	10,867	364	38	3:35	350 J. A. Caskey	Madoc, Ont.
67	Jesse DeKol Echo	6245	12,905	383	56	2:97	365 "	"
82	Canaan Sherwood Orpha	7298	9,358	297	28	3:17	365 F. E. Came	Ahuntsic, Qué.
90	Sally Snow	6996	9,822	395	78	4:015	362 N. Sangster	Ornstown, Qué.
93	Winnie Calamity Posch	6502	9,691	311	96	3:23	319 R. J. Miller	Fonthill, Ont.
95	Lady Grey of Ornstown	7617	9,331	303	78	3:25	273 N. Sangster	Ornstown, Qué.
101	Genista	7180	12,694	391	19	3:08	309 A. A. Johnston	Straffordville, Ont.
107	Cozey of the Old Farm	7110	11,709	392	89	3:35	320 M. N. Matthews	Luton, Ont.
119	Bessie Jane DeKol	7365	11,977	395	19	3:30	365 S. M. Peacock	Mt. Salem, Ont.
123	Fairy Winsumer	6854	11,496	377	659	3:286	365 Thos. Hartley	Downsview, Ont.
127	May Flower Posch	7549	10,132	333	45	3:29	309 N. Sangster	Ornstown, Qué.
132	Nellie's Pet	7489	10,548	362	31	3:43	302 Tig. Wood	Mitchell, Ont.
133	Quora 4th	6372	10,021	311	81	3:11	358 R. O. Morrow	Hilton, Ont.
135	Sylvia	7765	13,456	420	93	3:12	320 U. E. Wartman	Warkworth, Ont.
137	Bonnie Pauline Jane	8174	12,993	427	3	3:29	860 Miss G. E. Peacock	Mt. Salem, Ont.
140	Helbon DeKol 2nd	8511	14,889	526	37	3:53	365 E. Laidlaw & Son	Aylmer West, Ont.
154	Helena Hengerveld Keyes	7396	13,328	411	61	3:09	306 A. D. Foster	Bloomfield, Ont.
155	Korndyke Pietertje Keyes	7395	13,239	425	03	3:21	306 "	"
159	Aaggie Mercedes	7667	13,443	475	56	3:53	365 J. M. Van Patter	Aylmer, Ont.
163	Dandy DeKol Isabella	7695	9,783	281	60	2:88	332 F. I. Burrill	Holbrook, Ont.
169	Fancy B. Posch	8428	9,145	357	82	3:91	264 R. Clarke	Henfryn, Ont.
173	Desti	8082	18,993	568	32	2:99	365 J. B. Arnold	Easton's Corners, Ont.
179	Princess Susie of Malahide	8085	12,167	434	75	3:57	302 E. Laidlaw & Sons	Aylmer West, Ont.
181	Brooklands Korndyke Wayne	9517	11,545	408	77	3:54	365 J. W. McCormick	Moreswood, Ont.
184	Pontiac Lula	9853	11,882	376	47	3:16	335 Monro & Lawless	Thorold, Ont.
202	Niagara Maid	9333	13,650	511	31	3:74	365 John C. Brown	Stamford, Ont.
208	Korndyke Pauline DeKol	9320	9,501	357	46	3:7	347 J. W. McCormick	Moreswood, Ont.
213	Korndyke DeKol Daisy	10317	10,034	369	59	3:68	251 R. Clarke	Henfryn, Ont.
219	Cloverleaf Favorit Mercena	9147	14,281	456	36	3:19	350 A. K. Smith & Son	Millgrove, Ont.
226	Manor DeKol Netherland	9608	10,397	462	82	4:45	365 J. W. McCormick	Moreswood, Ont.
227	Madam B. 2nd's Pauline	9218	9,590	332	74	3:46	363 R. W. Walker	Utica, Ont.
250	Violet's Daisy's Pauline	9132	11,470	423	90	3:7	310 Dr. John Watson	Howick, Que.

COWS TWO YEARS OLD AND UNDER THREE.

3	Verona	6419	8,788	294	99	3:34	319 N. Sangster	Ornstown, Que.
6	Dorothy Dorliska	5285	9,407	335	98	3:57	327 G. H. Caughell	Aylmer, Ont.
12	Wopke Posch	7406	7,870	287	38	3:65	318 E. Laidlaw & Son	"
13	Ina Pauline Mercedes	6063	12,060	454	65	3:59	359 H. Bollert	Cassell, Ont.
15	Beulah Colantha	6907	9,030	296	79	3:28	365 N. Sangster	Ornstown, Que.
17	Rose DeKol Teake	6976	9,366	306	5	3:27	312 G. W. Clemons	St. George, Ont.
26	Bell Tensen	6736	10,927	350	49	3:20	325 Wm. E. Mason	Tyrrell, Ont.
27	Minnie Springbrook	6735	10,121	307	98	3:04	296 "	"
28	Queen DeKol of Minster	6001	9,420	301	5	3:20	365 R. Honey	Brickley, Ont.
29	Cozey of the Old Farm	7110	11,162	383	6	3:43	365 M. N. Matthews	Luton, Ont.
30	Madeline 2nd	7616	10,121	365	69	3:61	365 N. Sangster	Ornstown, Que.
32	Lady Grey of Ornstown	7617	9,432	312	7	3:31	365 "	"
37	Aggie Schuiling DeKol	6112	13,283	410	14	3:08	365 J. M. Van Patter	Luton, Ont.
38	Netherland DeKol Witzzyde	7665	11,907	385	33	3:23	322 "	"
39	Aggie DeKol Schuiling	7666	10,831	354	6	3:27	365 "	"
44	Bessie DeKol Tensen	7852	10,184	315	78	3:10	345 W. F. Mason	Tyrrell, Ont.
48	Lady Elgin J.	5761	9,679	315	81	3:26	330 F. Leeson	Aylmer, Ont.
49	Evaline DeKol	9110	13,146	419	1	3:18	365 "	"
51	Seymour Jessie	7347	9,072	296	18	3:26	365 W. E. Hermiston	Brickley, Ont.
52	Mary Anderson 3rd	7262	9,385	358	47	3:82	358 G. W. Clemons	St. George, Ont.
53	Laura Albino DeKol	7344	9,074	269	02	2:90	365 R. Honey	Brickley, Ont.
58	Lucy Staples	7850	10,321	381	96	3:70	342 Wm. E. Mason	Tyrrell, Ont.
65	Aggie Mercedes	7067	11,745	399	8	3:40	365 J. M. Van Pater	Luton, Ont.
68	Princess Helen DeKol	7983	10,997	328	18	2:98	328 Isaac Bateman	Innisfall, Alta.
70	Lassie Artis Johanna	10846	11,231	322	86	2:83	303 G. A. Brethen	Norwood, Ont.
71	Mayflower Posch	7549	8,852	296	72	3:35	332 N. Sangster	Ornstown, Que.
74	Canaan Queen	7264	10,166	318	4	3:15	365 F. E. Came	Ahuntsic, Que.
75	Maggie Verbeile	7860	10,629	329	84	3:10	350 B. Mallory	Frankfort, Ont.
79	Favorit of Downsview	7936	10,854	383	56	3:53	366 Thos. Hartley	Downsview, Ont.
88	Pauline Texal	9646	13,283	422	6	3:18	365 E. Laidlaw & Sons	Aylmer West, Ont.
89	Princess Susie of Malahide	8085	11,273	381	03	3:38	335 "	"

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COWS TWO YEARS OLD AND UNDER THREE—*Concluded.*

R. of F.	Name.	Reg. No.	Lbs. Milk.	Lbs. Fat.	Per cent of Fat.	Days in Milk.	Owner.	Address.
97	Jenny Bonerges Ormsbv...	8216	16,849.16	666.32	3.95	365	D. C. Flatt & Sons	Millgrove, Ont.
98	Seymour Rose DeKol.....	8975	8,800	275.75	3.13	365	Wm. E. Hermiston	Brickley, Ont.
102	Jolie DeKol	8558	10,142.62	335.33	3.30	315	Jean Chiasson....	Rustico, P.E.I.
103	May Flower Gypsy.....	8646	9,594	298.07	3.10	365	Isaac Bateman....	Innisfail, Alta.
108	Korndye Pet.....	10532	8,334	318.67	3.82	304	John Marks.....	Norwood, Ont.
109	Meadowlane Lassie.....	10565	9,369.4	313.65	3.34	355	B. Mallory.....	Belleville, Ont.
114	Ida Mechtilde DeKol.....	8783	11,208	373.73	3.33	365	G. H. McKenzie...	Thornhill, Ont.
115	Lady Faforit Posch.....	8949	10,593.6	385.84	3.64	355	"	"
117	Aaggie DeKol Mercedes...	8351	8,985	295.6	3.29	365	J. M. Van Patter...	Alymer, Ont.
120	Maud Holland DeKol.....	7478	8,879.5	335.65	3.78	365	"	"
130	Belle Dewdrop 5th.....	8514	14,058	450.46	3.20	365	E. Laidlaw & Sons	Alymer West, Ont.
138	Della 2nd.....	8333	12,854.5	459.6	3.575	365	"	Alymer, Ont.
142	Mercedes May.....	8302	9,055.25	291.19	3.21	365	Wm. Watson.....	Pine Grove, Ont.
143	Lady Tillie Acema.....	9229	8,290	308.65	3.72	361	R. O. Morrow....	Hilton, Ont.
145	Daisy Quirk.....	11190	10,009.09	395.26	3.95	348	Thos. Hartley...	Downsview, Ont.
146	Tensen Posch DeKol.....	9567	12,006.39	365.92	3.04	365	"	"
148	Queen DeKol Peer 2nd.....	10203	10,339.1	365.75	3.54	338	Edgar Dennis.....	Newmarket, Ont.
152	Boutsje Posch Mercedes...	10356	8,927.95	262.33	2.938	288	S. Lemon.....	Lynden, Ont.
153	Summer Hill Countess....	9287	13,250.5	422.23	3.33	342	C. R. Dyke.....	Armitage, Ont.
157	Lakeview Rattler.....	11364	14,401.3	504.87	3.50	365	E. F. Osler.....	Bronte, Ont.
160	Canaan Beauty.....	8457	9,431	291.58	3.09	365	F. E. Came.....	St. Lambert, Que.
161	Lady Fairmont Posch.....	10679	9,525.17	281.30	2.95	308	F. I. Burrill.....	Holbrook, Ont.
164	Polly Woodland DeKol.....	10390	9,433.15	302.64	3.20	365	S. M. Peacock.....	Mt. Salem, Ont.
167	Aaggie DeKol of Woodland	10413	11,884.5	382.31	3.21	365	J. M. Van Patter...	Aylmer, Ont.
168	Korndyke DeKol Daisy.....	10317	9,655.75	349.52	3.61	302	R. Clarke.....	Henfryn, Ont.
170	Diana Woodland Sarcastic.	10389	9,595.45	375.23	3.91	358	G. E. Peacock.....	Mt. Salem, Ont.
171	Korndyke Wayne DeKol....	9609	10,932	408.70	3.73	340	J. W. McCormick...	Morewood, Ont.
177	Pauline DeKol Albino.....	9621	11,071.6	361.77	3.26	365	S. G. Carlyle.....	Chesterville, Ont.
178	Belle Dewdrop 6th.....	10133	11,391	338.39	2.97	312	E. Laidlaw & Sons	Aylmer West, Ont.
182	Queen's Pride of DeKol...	10955	9,718.25	295.82	3.04	365	R. Honey.....	Brickley, Ont.
187	Lucy DeKol Posch.....	8326	12,328	408.18	3.31	365	J. M. Van Patter...	Aylmer, Ont.
192	Canaan Mosetta.....	8527	9,701	336.93	3.47	365	F. E. Came.....	St. Lambert, Que.
193	National Queen DeKol.....	10134	14,735.5	506.16	3.43	316	E. Laidlaw & Sons	Aylmer West, Ont.
194	Lady Calamity Pauline....	11248	10,369.81	332.73	3.20	365	Cecil W. Hagar...	Welland, Ont.
195	Doris Lee Pietertje.....	9011	11,324.75	404.96	3.57	327	S. J. Foster.....	Bloomfield, Ont.
197	Aaggie Emily of Riverside.	10253	14,376.5	455.27	3.16	365	L. W. Hutchinson...	Aurora, Ont.
199	Buffalo Girl Butter Maid..	11651	13,114.4	443.34	3.38	328	Tig. Wood.....	Mitchell, Ont.
201	Bessie DeKol of Niagara...	9354	13,439.18	462.86	3.44	365	John C. Brown...	Stamford, Ont.
204	Johanna Mercedes of River- side.	10358	11,520.7	377.56	3.27	336	C. Duff Nelles...	Boston, Ont.
205	Belle Mercedes Posch.....	12117	9,265.75	295.74	3.19	365	Elias Ruby.....	Hickson, Ont.
207	Lulu Keyes.....	10333	19,258.45	542.67	2.81	365	E. B. Mallory.....	Frankford, Ont.
210	Utica Teake DeKol.....	9009	10,440.5	363.71	3.43	365	A. J. Tamblin....	Orono, Ont.
211	Princess Concordia.....	11445	11,401	375.96	3.29	365	"	"
214	Sady Teake DeKol Beryl....	12564	8,864.81	307.41	3.46	293	R. Clarke.....	Henfryn, Ont.
217	Boutsje Posch De Boer....	8634	10,700.9	391.93	3.6	349	S. Lemon.....	Lynden, Ont.
218	Agnes Evergreen.....	10339	9,423.6	324.67	3.4	344	"	"
223	Korndyke Pauline DeKol 2nd.	11573	8,975	381.59	4.25	333	J. W. McCormick...	Morewood, Ont.
224	Korndyke DeKol Queen...	14124	7,548.75	290.35	3.84	307	"	"
225	Brooklands Korndyke Gem	11812	8,615.06	334.91	3.8	327	"	"
226	Summer Hill May.....	9288	10,242.5	311.90	3.04	319	John F. Smith...	Armitage, Ont.
231	Princess Calamity Posch DeKol.	10505	11,021.5	347.12	3.14	336	Tig. Wood.....	Mitchell, Ont.
233	Gertie Posch Westwood...	11862	10,869.82	343.06	3.15	363	Thos. Hartley....	Downsview, Ont.
234	Schulling Pride 2nd.....	12007	7,872.6	312.69	3.97	365	"	"

SESSIONAL PAPER No. 15b

JERSEY—COWS FIVE YEARS OLD AND OVER.

R. of P.	Name.	Reg. No.	Lbs. Milk.	Lbs. Fat.	Per cent of Fat.	Days in Milk.	Owner.	Address
7	Fancy's Countess	694	8,589·5	493·88	5·75	365	A. H. Menzies & Son	Pender Island, B. C.
11	Aristocrat's Fanny	1188	11,097·5	539·48	4·86	365	B. H. Bull & Sons	Brampton, Ont.
13	Brampton Blue Fly	300	9,982·4	511·91	5·12	365	"	"

JERSEY—COWS FOUR YEARS OLD AND UNDER FIVE.

8	Lady Buttercup of Pender.	698	9,305·5	465·52	5·01	365	A. H. Menzies & Son	Pender Island, B. C.
9	Golden Milkmaid	1,483	8,442·5	409·41	4·85	328	"	"

JERSEY—COWS THREE YEARS OLD AND UNDER FOUR.

6	Lady Rose of Pender	699	10,086·5	459·33	4·55	364	A. H. Menzies & Son	Pender Island, B. C.
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JERSEYS—COWS TWO YEARS OLD AND UNDER THREE.

1	Lilac of Pender	697	5,674·	314·15	5·53	352	A. H. Menzies . . .	Pender Island, B. C.
2	Lady Buttercup of Pender.	698	8,016·	449·7	5·61	352	"	"
3	Lady Rose of Pender	699	8,014·	427·34	5·35	352	"	"
4	Lady Grey	804	6,495·23	364·37	5·61	341	Frank Glydon & Son	Kensington, P. E. I.
5	Brampton Lady George	1,132	11,001·85	445·63	4·14	365	B. H. Bull & Son..	Brampton, Ont.
10	Lady Flora	729	7,549·87	343·94	4·55	266	Wm. Clark	North Wiltshire, P. E. I.
12	Brampton Fereor Tister	987	6,576·	326·28	4·9	364	B. H. Bull & Son..	Brampton, Ont. . . .

APPENDIX No. 21.

REPORT OF THE CANADIAN NATIONAL LIVE STOCK ASSOCIATION.

LIST OF DELEGATES PRESENT.

Third General Convention held at Ottawa, February 12 and 13, 1912.

OFFICERS.

President—Robert Ness, Howick, Que.

Vice-President—Andrew Graham, Pomeroy, Man.

Secretary-Treasurer—A. P. Westervelt, Toronto, Ont.

Directors—John A. Turner, Calgary, Alta.

Napoléon Lachapelle, St. Paul l'Ermite, Que.

P. M. Bredt, Regina, Sask.

A. D. Paterson, Ladner, B.C.

M. Cumming, Truro, N.S.

W. W. Ballantyne, Stratford, Ont.

PROVINCIAL DEPARTMENTS OF AGRICULTURE.

Alberta—W. F. Stevens, Edmonton.

Saskatchewan—Robt. Sinton, Regina.

Manitoba—F. W. Brodrick, Winnipeg.

Ontario—G. E. Day, Guelph.

New Brunswick—W. W. Hubbard, Fredericton.

Nova Scotia—M. Cumming, Truro.

Prince Edward Island—Theodore Ross, Charlottetown.

PROVINCIAL COUNCIL OF AGRICULTURE OF QUEBEC.

W. H. Walker, M.L.A.

PROVINCIAL LIVE STOCK ASSOCIATIONS.

Vancouver Island Flockmasters':—C. H. Hadwen, Duncan; Alex. Davie, Ladner; A. C. Aitken, Duncan.

British Columbia Stock Breeders' Association:—A. D. Paterson, Ladner; S. Smith, Dewdney; George Sangster, Victoria.

Alberta Cattle Breeders' Association:—J. L. Walters, Lacombe; Wm. Sharp, Lacombe; E. L. Richardson, Calgary.

Alberta Horse Breeders' Association:—Geo. Lane, Calgary; J. C. Hargrave, Medicine Hat; E. L. Richardson.

Alberta Sheep Breeders' Association:—Bryce Wright, De Winton; E. L. Richardson.

Alberta Swine Breeders' Association:—Lew Hutchinson, Duhamel; Rice Sheppard, Strathcona; E. L. Richardson.

Cattle Breeders' Association of Manitoba:—James Yule, Selkirk; James Duthie, Hartney.

Horse Breeders' Association of Manitoba:—John R. Scharff, Hartney; A. C. McPhail, Brandon.

Sheep and Swine Breeders' Association of Manitoba:—A. Mackay, Macdonald; Andrew Graham.

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- Dominion Cattle Breeders' Association:—John Gardhouse, Highfield; W. W. Ballantyne, Stratford; A. P. Westervelt.
- Ontario Horse Breeders' Association:—Wm. Smith, Columbus; Walter Milne, Green River; A. P. Westervelt.
- General Stock Breeders' Association, Quebec:—Arsène Denis, St. Norbert; Thomas Drysdale, Allan's Corners; J. A. Couture.
- Sheep Breeders' Association of Quebec:—James Bryson, Brysonville; G. Garceau, Three Rivers; J. A. Couture.
25289—1½
- Swine Breeders' Association of Quebec:—J. R. Monahan, St. Lin; J. A. Couture.
- Maritime Stock Breeders' Association:—H. Montgomery Campbell, Apohaqui; W. W. Black, Amherst; C. A. Archibald, Truro; F. L. Fuller, Truro.
- Ontario Sheep Breeders' Association:—Robt. McEwen, Byron; A. P. Westervelt.
- Ontario Yorkshire Breeders' Association:—J. E. Brethour, Burford; Wm. Jones, Zenda; A. P. Westervelt.
- Canadian Berkshire Breeders' Association:—John Kelly, Shakespeare; A. P. Westervelt.
- Saskatchewan Horse Breeders' Association:—W. H. Bryce, Arcola; P. M. Bredt.
- Saskatchewan Cattle Breeders' Association:—Geo. Kinnon, Cottonwood; P. M. Bredt.
- Saskatchewan Sheep Breeders' Association:—Robt. M. Douglas, Tantallon; A. B. Potter, Langbank; P. M. Bredt.
- Saskatchewan Swine Breeders' Association:—M. J. Brennan, Francis; J. M. Stowe, Regina; P. M. Bredt.
- Farmers' & Dairymen's Association of New Brunswick:—H. Montgomery Campbell; And. J. Jensen, Salmonhurst; Bliss M. Fawcett, Sackville.
- Maritime Sheep Breeders' Association:—James A. Telfer, Markhamville.

CANADIAN RECORD ASSOCIATIONS.

- Dominion Swine Breeders' Association:—R. J. Garbutt, Belleville, Ont.; Samuel Dolson, Norval Station, Ont.
- Dominion Sheep Breeders' Association:—Jas. Snell, Clinton, Ont.; J. M. Gardhouse, Weston, Ont.
- Dominion Shorthorn Breeders' Association:—T. E. Robson, London, Ont.; H. Smith, Hay, Ont.; W. G. Pettit, Freeman, Ont.; A. W. Smith, Maple Lodge, Ont.; Robt. Miller, Stouffville, Ont.
- Canadian Ayrshire Breeders' Association:—W. F. Stephen, Huntingdon, Que.; R. R. Ness, Howick, Que.; W. W. Ballantyne, Stratford, Ont.
- Canadian Hereford Breeders' Association:—R. J. Mackie, Oshawa, Ont.
- Canadian Jersey Cattle Club:—R. Reid, Berlin, Ont.; L. J. C. Bull, Brampton, Ont.
- North American Galloway Association:—Robert Shaw, Brantford, Ont.; D. McCrae, Guelph, Ont.
- Canadian Guernsey Breeders' Association:—H. W. Corning, Cheggogin, N.S.; Daniel G. McKay, Heathbell, N.S.
- Canadian Aberdeen Angus Association:—W. R. Bowman, Brandon, Man.; F. J. Collyer, Welwyn, Sask.
- French Canadian Cattle Breeders' Association:—Louis Thouin, Repentigny, Que.; Victor Sylvestre, Clairvaux de Bagot; J. A. Couture.
- Canadian Red Polled Association:—J. T. Maynard, Chilliwack, B.C.; W. J. McComb, Beresford, Man.
- Clydesdale Horse Association of Canada:—Peter Christie, Manchester, Ont.; John Bright, Myrtle Station, Ont.; Robt. Graham, Bedford Park, Ont.; W. G. Graham, Claremont, Ont.; Fred. Richardson, Columbus, Ont.
- Canadian Shire Horse Association:—John Gardhouse, Highfield, Ont.; James Henderson, Belton, Ont.

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Canadian Hackney Horse Society:—W. C. Renfrew, Bedford Park, Ont.
 French Canadian Horse Breeders' Association:—L. P. Sylvestre, St. Theodore d'Acton, Que.; F. Manseau, Nicolet, Que.
 Canadian Percheron Horse Breeders' Association:—Geo. Lane, Calgary, Alta.
 Canadian Thoroughbred Horse Society:—D. McCrae.
 Canadian French Coach Horse Breeders' Association:—Baron Roels, Calgary, Alta.
 Canadian Standard Bred Horse Society:—George Pepper, Toronto, Ont.
 Holstein-Friesian Association of Canada:—G. W. Clemons, St. George, Ont.; T. A. Spratt, Billings Bridge, Ont.; W. W. English, Hamilton, Ont.; B. Mallory, Belleville, Ont.

VISITORS.

Name.	Address.
J. H. Clark,	Experimental Farm, Charlottetown, P.E.I.
J. A. Amear,	Lower Montague, P.E.I.
Wm. Houston,	Toronto, Ont.
F. C. Harrison,	Macdonald College, Que.
H. Barton,	Macdonald College, Que.
John Campbell,	Woodville, Ont.
R. S. Stevenson,	Ancaster, Ont.
J. D. Eadie,	Vars, Ont.
J. Herbert Smith,	Toronto, Ont.
R. E. Everest,	Experimental Farm, Scott, Sask.
Senator Douglas,	Tantallon, Sask.
S. F. Tolmie,	Victoria, B.C.
W. H. Fairfield,	Experimental Farm, Lethbridge, Alta.
G. H. Hutton,	Experimental Farm, Lacombe, Alta.
A. M. MacDonald,	Lacombe, Alta.
N. J. H. Wylie,	Toronto, Ont.
P. H. Moore,	Experimental Farm, Agassiz, B.C.
W. J. Stark,	Edmonton, Alta.
John P. Monahan,	St. Lin des Laurentides, Que.
R. Robertson,	Experimental Farm, Nappan, N.S.
F. A. Walsh,	V.S., Yarker, Ont.
Wm. A. Munro,	Experimental Farm, Rosthern, Sask.
J. S. Kyle,	North Winchester, Ont.
J. J. Ferguson,	Chicago, Ill.
R. J. Phin,	Moosomin, Sask.
H. C. McMullen,	Calgary, Alta.
E. Cora Hind,	Winnipeg, Man.
Hugh McKellar,	Moosejaw, Sask.
A. H. Hall,	D.V.S., Grimsby, Ont.
W. C. McKillican,	Experimental Farm, Brandon, Man.
J. H. Ashcroft,	Toronto, Ont.
C. C. L. Wilson,	Ingersoll, Ont.
F. F. White,	Toronto, Ont.
W. J. Langton,	Toronto, Ont.
J. Lloyd-Jones,	Burford, Ont.

GENERAL CONVENTION

OF THE

NATIONAL LIVE STOCK ASSOCIATION

The Third General Convention of the National Live Stock Association was held in St. Patrick's Hall, Ottawa, on February 12 and 13, 1912. Mr. Robert Ness, Howick, Quebec, president of the Association, occupied the chair at the opening meeting. The first business was the roll call and reading of the minutes of the last convention.

Moved by Col. H. Montgomery Campbell, and seconded by W. G. Pettit, that the minutes of the last meeting as printed be accepted as read. Motion carried.

PRESIDENT'S ADDRESS.

GENTLEMEN,—In calling this meeting to order, I need not say how much pleasure it gives me to welcome to this convention delegates from all parts of our great Dominion and to find that the various phases of our live stock industry are so capably represented by the gentlemen who are present here this morning. In setting before you in these few opening remarks, the subjects which are to occupy your attention throughout the several sessions, I am reminded of the important results which have followed previous conventions of this National Live Stock Association. You will remember that the nationalization of Canadian Live Stock Records was accomplished in consequence of the agreement that was reached at one of them. You will remember, also, that at another, after a very full discussion a decision was arrived at as regards the admission under uniform regulations of pure-bred live stock into Canada. The resolutions in which this decision was finally given definite form were later embodied in customs legislation subject to which, from that date until now, pure-bred live stock has entered this country.

In addition, however, to the friendly adjustment and settlement of difficult questions and to the favourable opportunities which were provided, of determining the best policy to be followed as regards matters of national significance in relation to our varied live stock interests, not the least important effect of these conventions has been the more cordial relationship and the better understanding which have been established amongst representative men from all parts of the country. We have during this convention some very important problems to discuss and some very difficult decisions to reach, but in the main your deliberations here can serve no more comprehensive purpose, can attain no more far-reaching result than that suggested in my last remark. I would ask you, therefore, to assist me in obtaining and preserving a national outlook in the discussions which are to take place and in securing a broad minded consideration of the subjects which appear on our programme. We must agree to subordinate individual and local interests to the interests of the country at large since in no other way can we justify the purpose for which this convention was called, and in no other way can we create that atmosphere out of which large results may grow.

We cannot but be impressed by the opportunities which are presented to us. It is opportune that we should confer together at a time when the falling off in live stock production reveals conditions which are very greatly to be deprecated. That the country is prosperous we have every reason to believe, but the increasing cost of living

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is creating an economic situation which cannot continue, particularly in view of the fact that the cost to the consumer is out of all proportion to the price realized by the farmer and breeder. Despite the fact that the domestic consumption of agricultural products is extending in every direction, the production of meats in Canada is declining proportionately and, it would appear, absolutely. Our export trade has dwindled, except in the case of bacon, to an almost insignificant item and our western provinces are depending to a larger and larger degree upon imported meats to provide for their requirements. The situation is becoming acute, and I submit the whole question to you for your most careful consideration.

Among the subjects which appear on our programme, possibly no other one is of more vital importance in its relation to our live stock interests than that of bovine tuberculosis. You are very well aware of the losses which are met with annually and which are to be charged directly to the presence of tuberculosis in our cattle and swine. Regarding these losses in the light of the prospective increase in the live stock of the country and remembering that the disease, if left unchecked, may be expected to increase in a much greater ratio, we cannot but realize the practical and economic significance of the whole subject, not to mention its immediate bearing upon the preservation of the general public health. The best trained intellects of the continent have given of their time and thought in an honest and public spirited effort to reach an agreement as to the best policy to be adopted with a view to the control and, if possible, eradication of the disease in both the United States and Canada. You are acquainted with their recommendations which, while conservative, are yet definite and which make it very evident that any prolonged postponement of aggressive action would neither minimize the difficulties to be anticipated nor serve the best interests of the stock owners of the country. That the discussion of this question is to be delegated to the capable hands of our Live Stock Commissioner speaks well for a satisfactory adjustment of the troublesome problems involved.

In further relation to the work which we shall have in hand, it has occurred to me, gentlemen, that the object for which this convention has been called will not be fully met unless we prepare ourselves to present to the Minister in a reasonably definite way the views of the stock men of Canada, as regards the measures which he may be justified in undertaking with the view of encouraging and stimulating the development of the industry in which we are all engaged and in which our most important interests are involved. We are here by invitation of the Minister to represent the live stock men of the Dominion, and it appears to me that we should fail in our duty if we were to shirk our obligation in this regard. Realizing as we must all do, that it is a responsible office which we assume in deciding upon such action, it behooves us to approach the task in no narrow spirit and to balance well the recommendations we may finally resolve to make. In counselling deliberation, however, and mature judgment, I would urge that, when convinced of the wisdom of any policy, we should freely and unhesitatingly advise its adoption. I commend, therefore, to the Committees on Resolutions, yet to be appointed, the far-reaching importance of the work with which they may be charged, and would urge upon them the necessity of it being given their best consideration and most careful attention.

In concluding these opening remarks, gentlemen, let me say that I want you to assist me in making this convention successful. I realize the responsibility that attaches to the position with which you have honoured me and that not a little will depend upon the chairman in making definitely effective the discussions which are about to take place. I cannot do it alone, however. Your individual co-operation is essential, and I feel that I bespeak it in the request which I now make. The subjects which follow are to be your subjects. This convention is to be your convention. We must combine to ensure its being productive of really practical and permanent results. The opportunities which are here afforded us are of such national importance that at the outset our view point must be broad minded to comprehend them. The task that

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confronts us is big enough to be worthy of our best effort. The presence of so many representative men from all parts of the Dominion has already charged the atmosphere with a spirit of optimism and of anticipation. In this spirit, gentlemen, I declare the convention open for business.

Col. CAMPBELL.—I move that the president's address be referred to a committee for consideration and reported back to this meeting.

(Motion seconded by Col. McEwen and carried.)

Mr. JOHN BRIGHT.—If it is in order, I desire to move, seconded by Dr. Tolmie, a resolution as follows: 'That R. Graham, Peter Christie, P. Bredt, N. Garneau, George Pepper, Professor Cumming, W. W. Hubbard, George Lane, M. McPhail, John Gardhouse and the mover and seconder be appointed a committee to consider all questions *re* the horse industry part of this convention, and to submit, not later than to-morrow afternoon, their recommendations as to the best means to be adopted for the improvement, betterment and more united conduct of the interests of this very great industry.' It is not necessary for me to take up much of your time on this question. We, as horsemen, consider that this question is a live one and that such a committee should be appointed to take into their earnest consideration these matters and to report on some means of getting together for the purpose of facilitating and bettering the horse industry. When it is considered that financially the horse industry of the Dominion is equal to the investment in all other kinds of live stock—I say, gentlemen, there is as much money tied up in the horse business in the Dominion as in all other live stock put together—when you take that into consideration, then we feel that some suggestions will come from this committee, which is composed of men in the business representing Canada from the Atlantic to the Pacific.

(Motion carried.)

ADDRESS.

Honourable Martin Burrell, Minister of Agriculture for Dominion of Canada.

It is hardly necessary for me to say that it affords me a great deal of pleasure to address a few brief remarks to gentlemen who represent such an enormous interest as that of the live stock of Canada, and who are here from all parts of this great country, from the Atlantic to the Pacific. It is not many years since live stock matters and other branches of agriculture were carried on with somewhat more of a provincial outlook than they are at present, and I think it is a happy state of things that we have at last come to the day and hour when we can look at all these things in the broadest light and regard our interests as absolutely national.

It is peculiarly significant and important that meetings of this kind should be gathered here at this particular time. I am not going to make any extraordinary announcements on the live stock industry. I will not even go as far as our friend, Mr. Bright, did and say that one thing is better than another, because I might get into trouble. As far as I understand it, there are conditions in the live stock industry that cause serious apprehension among our live stock friends and call for remedies which you will discuss here. If I understand it rightly, along some lines of your industry, notably that of beef cattle and export trade, there is a good deal of cause for anxiety. The Live Stock Commissioner, Dr. Rutherford, in his last report stated that the export trade, both in cattle and in meat, was not only diminishing to a very serious extent but that if the decrease went on, it was likely almost to disappear, and I heard several gentlemen at meetings I attended in Toronto and elsewhere lately, make a statement to the effect that the beef industry especially is not in the flourishing and progressive condition that it was even twenty-five years ago. I do not pretend to be able to offer any diagnosis of this situation or even to prescribe a remedy. All of us, who know the country from end to end can understand that in some parts of the country these conditions may be explained in a comparatively simple manner. We can thoroughly understand that in the west there are hundreds of thousands of people pouring in who are not able, as yet, to go into stock breeding and who are only, as it were, miners of the soil, confining their attention almost entirely to wheat, and the live stock industry has not kept pace with the extension of the wheat area.

In my own province of British Columbia, there are other explanations. In my own time, I have seen enormous cattle ranches become too valuable to be held for cattle purposes and they have been cut up into fruit ranches. One especially, right in my own riding, of about 40,000 acres, which was largely devoted to cattle, has now been cut up for fruit farming purposes. There is another in the northern part of my own riding where they have been running 15,000 head of cattle for a good many years, and they are now considering cutting that up for the same purpose. Therefore, you can understand why the cattle industry has diminished in British Columbia rather than increased. I do not know the situation in Ontario so well, except in so far as I have heard it discussed at your different meetings, nor do I know the conditions exactly in the eastern provinces, although I have had it put before me by some gentlemen recently from these provinces, who have pointed out a condition of things which calls for some encouragement, and I may say frankly here to any of these gentlemen who are present that we propose to give them that encouragement as far as possible. If this is true, it behooves us all now to try to look for remedies. It is, perhaps, not so easy to provide them as it may be to talk about them.

I do not need to say anything to you gentlemen who are so deeply concerned with the question of pure-bred live stock, except in a very earnest way to congratulate you upon the very valuable work which you have been doing for the live stock industry of Canada by promoting the introduction of pure-bred stock. Perhaps the ordinary

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man does not realize the importance of it to the extent that you do yourselves. Probably I ought not to say the 'average' man, but rather to say the careless man who thinks it is economy to buy an animal because it is cheap rather than a better one which would cost him a little more. That is one of the most fatal mistakes that is ever made. These men do not seem to appreciate the tremendous danger they are running, in deteriorating the whole cattle industry of the neighbourhood by the use of sires which transmit qualities that are absolutely undesirable. I would like to say to the National Live Stock Association—speaking as Minister of Agriculture—that the government realizes that your efforts along these lines have resulted in valuable work of which Canada is rightly proud.

What I have said in regard to live stock is equally applicable to horses, and I thoroughly sympathize with our friends, Mr. Bright and Mr. Smith and Mr. Miller and others whom I have heard discuss this question, and who claim, perhaps rightly, that the question of horse-breeding deserves and should receive every consideration. We in Canada, have not given the same consideration that has been given to that industry by other countries like Germany, Austria-Hungary and France. There are reasons why State aid should be more in evidence in some of these countries than it is in Canada, one of which is that the breeding of horses for military purposes, for their great army equipment, is a vital part of the national work and is to some extent responsible for the greater amount of State aid that is given than in countries of such an extremely peaceful character as Canada. After all, however, we never know what may happen, and it is just as well to proceed vigorously along all lines.

This leads to the question of how far the government is supposed to go in its encouragement and help to any particular industry. It may be a debatable question as to whether the government should do anything to help any industry besides keeping law and order and allowing the industry to be extended by private initiative. If, however, we consider the principle of State aid at all, in any direction, then it is not debatable upon what lines that State aid should move, as all governments throughout the civilized world have recognized that the first and fundamental movement that should be made along the lines of State aid is that of an educational kind, and accordingly all countries have recognized that generous assistance to education is always the legitimate function of State control. If that is so, then I think we might extend the principle somewhat further in its application and admit that educational work along the lines of supporting a prominent industry of any country is also justified. I think every man in this room will cordially agree with me when I say that the basic industry of agriculture is eminently one in which aid of that kind can be justified on the part of any government, even if I confine that remark to the educational side. If liberal support were given along that line, I am not at all sure but that, if educational methods were applied to their legitimate and rational conclusion along lines of agricultural work, it would ultimately do away with a great many of the difficulties under which you are labouring. As you know, a good deal of the work that you are doing to assist agriculture is of a distinctly educational character. We spend enormous sums in this country on such things as public works, dredging, assistance to railways by subsidies and in various other ways. Surely then, if we can spend these sums in these directions, every one of us will agree that support of a great industry like live stock, embracing as it does so many valuable features, would be proper and reasonable if conducted along right lines. The horse industry and the cattle industry and the sheep industry certainly might have a great deal done for them. I am glad to know that the government has been doing something recently to help the sheep industry. The best proof of the necessity for reasonable help along these lines is that according as we have a poor year in agriculture in this country, or a good year, it either makes or mars the prosperity of the whole country.

You all know that the Department of Agriculture of the government has done in the past—and I trust in the future will continue to do something towards helping

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agriculture. We have done a good deal along the lines of safe-guarding the interests that do exist. I think every man here will admit that much good has been done in the suppression of the various diseases, work which has been in charge of the capable Veterinary Director General of this country, Dr. Rutherford. A lot of valuable work has been done in safe-guarding your interests against danger from the outside and also towards the aggressive extermination of dangers from the inside. This work is largely educational and should be carried on in such a way as to help this great live stock industry.

There is that great problem which has been touched on by Dr. Rutherford, the question of tuberculosis which is continually cropping up, and no doubt in the near future, some action will be taken with regard to it. It is true that it is better to move slowly than to move in the wrong direction, and it is better to move wisely even if progress is a little slow, but some action will have to be taken before long and a lot of educational work will have to be done before any drastic methods can be adopted. These are questions which you will discuss.

I have no doubt that in the course of your convention, many important matters will come up for discussion. A convention of this kind cannot fail to do a great deal of good. I have attended a great many conventions during the last twenty-five or thirty years, and I never saw a convention of this kind in which there was not a large amount of resulting good. It must necessarily come from the interchange of experience and from the gathering together of men who are experts along particular lines.

As far as the government is concerned, I may assure you that you have a government that is in sympathy with the great industry which you represent here to-day. Although at conventions of this kind, the tendency is sometimes to ask the government to do almost more than you expect—there are apt to be some hot heads—there are always a number of reasonable, level-headed, broad-minded men who look at these things from a practical standpoint. I would urge, therefore, that any suggestions you may have to make, which will come before me or the government, you frame in such a way, having regard to the conditions of the country and the government and everything else, that we will at least be prepared to meet some of them. I could not, of course, say that we will meet all of them, although perhaps you may be so extremely reasonable that that will be possible.

It affords me a great deal of pleasure to be here this morning, and it will afford me still more pleasure to come as often as I can to your meetings, but I think you will thoroughly realize that it may be impossible for me to do more than pay a brief visit now and again.

I hope this afternoon to have the pleasure of asking leave to introduce a bill into the House of Commons for the aid and encouragement of agriculture. It is the first bill of the kind, I think, that has been introduced, and it redeems a promise made to the people of this country by the Prime Minister. Although it is true that we cannot intelligently frame any broad measure to aid agriculture, especially in the various provinces, and work it out on lines of co-operation until there has been a most exhaustive survey of all the conditions, so that we will know exactly whether we are moving on right lines or not, yet in the meanwhile it is the intention of the government to introduce a bill providing at least some substantial help to all the provinces in connection with agriculture. It would not be proper for me to outline exactly what lines that will take, but I will say it will take the line of assisting each province rather than the direct way of arranging for the expenditure ourselves. It will be done in the belief and hope that the people of the provinces, represented by their governments, will know best how wisely to administer that help to the most pressing needs of agriculture in their respective provinces. It will be the business for you gentlemen who represent so large and important a phase of agriculture, to bring your particular needs before the governments of your provinces.

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I say again that I am particularly glad to be here and to recognize the fact that you are all here for one purpose, namely, to better the conditions of the live stock industry of Canada. I trust you will not lose sight of the broad, national feature of the work, and I am convinced that every one of you will consider matters in a wise and sane spirit and do, so far as every man can do, his part to better and improve the whole conditions of the industry.

ADDRESS.

J. G. Rutherford, C.M.G., Live Stock Commissioner.

I need scarcely say that I am very pleased to have the opportunity of again addressing a gathering of the live stock men of Canada. I always feel very much at home in assemblages of this kind, because I have spent my life among live stock and live stock men and know that the live stock men are the salt of the earth, and, by all odds, the cream of the farming community. I feel more at home in an assembly of this kind than anywhere else.

I have listened, as you all have, with a great deal of appreciative interest to the address of the president and to the address of the Honourable Minister of Agriculture. I do not think it is necessary for me to enlarge further on the importance of this gathering or to say much about the object for which it is called. The programme speaks for itself, and I have no doubt from the names which appear on that programme that we will have a most interesting and most profitable discussion.

This National Live Stock Association has held only a few meetings, but at every meeting which has heretofore been held something important has been done. Never in the whole history of the Dominion has there been so great a necessity for sane, sober, serious and intelligent consideration of the live stock conditions as exists at the present time. We are face to face with a most remarkable situation. One of the greatest agricultural countries in the whole world, a country which prides itself on its agriculture, is in the remarkable position of importing and of being an importer of food products, of live stock products, to an enormous extent. Before this meeting is over, you will hear from different quarters, some figures which are actually astounding in their magnitude as to the increasing proportion of the importations of live stock products to this great country. We who are familiar with live stock conditions and who are enthusiastic on behalf of the live stock industry, realize fully what live stock means to the agriculture of any country and we know what the live stock industry means to the agriculture of Canada. Unfortunately, however, we have a number of people who do not grasp the importance of the live stock industry from an agricultural point of view, and that is one justification of what I said when I began my address, that the live stock men were the 'salt of the earth.' I look upon every man who engages in the live stock industry as an intelligent man; every man who makes a success of the live stock industry, whether as a breeder of pure-bred stock or a producer of commercial live stock, I look upon him as an important factor in the community in which he lives. I only wish we could get a sufficient number of apostles to go through the country and preach this gospel of live stock and live stock production.

When you consider it there is a tremendous waste of animal food going on every year in Canada, and when I speak of animal food I do not want any confusion to exist in regard to the meaning of that term. An old gentleman who had become somewhat anaemic was told by his doctor to take more animal food, and a few days afterwards the doctor met him and he said: 'You are looking very, very bad. Did

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you take my advice and eat more animal food?' 'Why, yes,' the old gentleman said, 'I did not do so bad on the bran and oats, but the hay did not agree with me at all.' Now, when I speak of the waste of animal food, I refer to the grass which grows up every spring and which is allowed to wither every fall, and which has not, in the meantime, been manufactured into marketable products. I refer to the millions of tons of straw which are destroyed every year in the northwest provinces and the tremendous waste which goes on every year in Canada in that regard through the short-sightedness of our people.

I was a statesman once, you know, and they entrusted to me 362 Doukhobors, who landed in this country in 1898 from the old country. These 362 Doukhobors came to Portage la Prairie and we housed them in the old court house. They used to start out in little parties of ten or a dozen in the morning—it was in the winter time—and they would hie themselves across the frozen prairies and walk all day and come back to the court house at night. I used to wonder what they were doing, but I could not speak the Ruthenian language and they were not familiar with Scotch and we could not communicate with each other. We had a number of gentlemen who would have liked to become office holders under the government and they came to me and asked that they should be appointed farm instructors for these poor ignorant Doukhobors who had left the steppes of Russia and had come to Portage la Prairie to commence farming on the prairies. I had a number of applications from men who were more or less successful in farming who wished to become instructors in agriculture to these people. I had an interview with the leader of the Doukhobor congregation through an interpreter, and he came back to me with a smile on his countenance and said, 'These people say that they do not want your instructors. They say that they have gone out and travelled all over this district. They have gone out every morning and have visited from twenty to thirty farms every day and they say they do not want to learn the kind of farming that is followed in Canada. They say there is more waste on one Canadian farm than would keep five Doukhobor families.' There is no doubt that is true, and it is particularly true in the new provinces in the west. People forget so easily.

Consider the history of the wheat production on this continent. It is within the memory of men still living when the centre of the wheat industry on this continent was in the Genesee valley, which is across in the State of New York. It gradually worked its way westward through Ohio, Indiana, Illinois, Iowa, northern Minnesota and Dakota, and to-day it is in the province of Saskatchewan.

If you take the various members of the Clan of Ananias, who are found spread all over the country between the Red River and the Rocky mountains, who will dilate on the tremendous possibilities and the productiveness of our prairie land, you will find them reiterating a statement that these are absolutely inexhaustible. They will say that they have grown wheat for sixty-five years in succession and that they are still growing it profitably. That is the story you hear, but we all know the history of the other wheat districts where year by year the yield decreased and decreased. In our Canadian northwest, the same thing will happen as happened to the people in the State of New York and in Ohio and Indiana and Minnesota and Dakota, and we will run out of the wheat-growing soil and it will become exhausted of its wheat-growing capabilities and then where will we have to turn? We will have to turn to the live stock, and the important thing is to get that live stock in there now to retain the fertility of the soil and not allow it to become exhausted. We must develop the live stock industry in order to husband our resources, and we must give up this land-robbing which lands every man who persists in following it in the poor house.

Are we as a nation doing what we ought to do in this regard? I say, no. I have seen, and you western men have seen, and you can see to-day that if you go out on a farm and stay for supper you get your tea without any milk because there is no cow; you get canned vegetables and there are no fresh eggs because there are no hens, and

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baker's bread is taken out from the town in a sack, and the butcher's wagon drives up to the house on the prairie two or three times a week. Why, I have seen farmers hauling home, in the month of May, four or five bales of hay in a wagon in order to enable them to feed their horses until they get their crop in! Is not that ridiculous, but that is exactly what we, as a nation are doing to-day in the matter of the proper developing and husbanding of our national resources? It is ridiculous and absurd that for years back we should have been importing mutton from Australia. Until last year it came in only from the west, but last year it came in from the east and it was landed in St. John, New Brunswick, and in Montreal, and the people in Montreal and Toronto were eating Australian mutton. Go down here on Laurier avenue to the first grocery store and what do you find? You will find South American beef in tins, and you will find that same brand of beef all the way across the continent. You will find beef from the Argentine Republic and Uruguay in Regina and Moosejaw, right in the centre of what should be the greatest beef-producing country in the world. These are things that we ought to consider.

Before this convention is over, a great many of these questions will be threshed out, and we will have a tremendous amount of information of the most valuable kind and I trust that much of it will be crystallized into such resolutions as you will be able to lay before the Honourable Mr. Burrell and his colleagues in the hope of getting some intelligent assistance in the direction of forwarding the great industry which we are so anxious to advance.

One word of explanation before I sit down. I think I owe it to our president. You may have noticed right behind me a picture hanging on the wall. It is a picture of an Ayrshire cow. The president is not responsible for that picture being there nor is any member of his family. In a sense, I am responsible for the hanging of that solitary picture there. I know there is a feeling of resentment—I see Mr. Clemon's eye. I notice that a few of our short-horn friends are palpably very much annoyed at the prominence given that Ayrshire cow, and I see a few admirers of the Channel Island breeds wondering why that red and white thing was hung up there.

The picture was hung there because it represents one of the best dairy cows in the Dominion, and she comes from Prince Edward Island. This is the Ayrshire cow, 'Milkmain 7th,' owned by A. McRae and Son, of East Royalty, P.E.I., which when entered into the Record of Performance test was nearly three years old. During the test her total production was 11,673.5 pounds of milk with 492.757 pounds of butter fat, the required production for cows of her class being only 6,446 pounds of milk with 232.4 pounds of butter fat. When I was presented with that picture last week, I said, 'We will hang it in the Convention Hall to show the members that something good can come from Prince Edward Island.' I said to myself, 'We will hang it there for another reason; because that cow is an indication of what intelligent, systematic, persistent and conscientious effort can do in the development of the dairy industry of our country, we will hang it there also because it will serve as an incentive to the men who are interested in the beef breeds, because it will be there as a constant note of warning to them that unless they wake up, this cow and the like of her will put them out of business.' Thus the picture is there for a number of reasons: to promote strife, to induce jealousy and to act as a bone of contention for this whole convention.

Being Scotch, I made up my mind that I would have a reason ready to protect myself from any possible attack that might be made upon me for having singled out this particular breed as being representative of the lower animal kingdom, and the reason she is there and that there are no others is because none of the rest of you brought them along.

I wish you every success in this convention. I know it will do good. I feel it is one of the most important gatherings which will take place in Canada during the present year, and I only trust that the lines indicated by the Honourable Mr. Burrell

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will be followed and that the work of the convention will finally be put in such shape as to enable him and his colleagues to do something beneficial to the live stock industry in which we are so much interested.

PRESENT CONDITIONS OF THE LIVE STOCK INDUSTRY IN THE MARITIME PROVINCES.

Professor M. Cumming, Principal Agricultural College, Truro, N.S.

Casting my eye over the programme, I notice that you are to listen to a series of addresses upon the live stock industry of the various sections of the Dominion, and I presume that we are supposed to be more or less sectional in our remarks. So far, the addresses of this convention have been of a general character, and whatever I have to say will be with reference to the live stock industry in the Maritime Provinces. In the addresses of the Honourable Minister of Agriculture and the Live Stock Commissioner, we have listened for the most part to remarks with regard to live stock as related to the newer sections of the country, but I am going to speak from the standpoint of the oldest settled parts of the Dominion, where we have long ere this exhausted the soil through just as foolish methods as are now prevailing in the west, and where we now look to the live stock industry as the only means of maintaining the fertility of our soil.

There is no question about it, that if any part of Canada is calling for a development of the live stock business, it is that part with regard to which I am speaking at the present time. I can take you to farm after farm where, as a result of the policy of raising food products and keeping very little live stock, the fertility of the land is reduced to such a state that the people in some cases are actually forsaking their farms. In years when we suffered from drought, it was a universal comment that on those farms where live stock were kept, the crops were almost up to the average, and in some cases even above the average. Without exception, on those farms where live stock had not been kept and where the fertility had been reduced and the amount of humus in the land diminished, the crops were almost a complete failure. I can point out farm after farm in the Maritime Provinces, where, as a result of keeping live stock for the last five or eight years, the output has been increased from a smaller acreage as compared with adjoining farms where live stock was neglected. I can point out cases where young men who have spent their early days in the United States have come back to take up the old homestead farm, and by keeping live stock, are doing much better than they could on the other side of the line.

I can recall one instance where a young farmer returned from the United States and, having learned a few lessons, he increased the number of the live stock, improved their quality and trebled the output of the farm. From these instances, we are more and more impressed with the fact that in live stock alone lies the salvation of our maritime agriculture.

The outstanding feature of our development during the last six years has been improvement in dairy cattle and heavy horses. I shall first speak of these and then pass on to beef cattle, sheep and swine. The development with regard to dairy farming has been phenomenal, and we are willing to take second place to none in the case of some of our herds. Our reputation is being recognized, and we have sent stock bulls to the western states and the northwest, and a very considerable number of pure-bred stock have been sent as far west as British Columbia. All this goes to show that our breeders have come to realize as they never did before, that it pays to have the best. My experience has been, that the cheapest stock I have bought has, in the end, been the most expensive, and now instead of buying any cheap stock, I confine my attention entirely to the highest priced stock.

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I am glad that the representative of Prince Edward Island saw fit to present the Live Stock Commissioner with this picture of a dairy cow. She represents the value of keeping a record of production. Prince Edward Island, at the present time, holds the world's record for a two-year-old Ayrshire, but I am sorry to say she is likely to be beaten shortly. The record of this cow is 11,673 pounds of 4 per cent milk, and we are told that our average production per cow is only 3,000 pounds.

I want to say a few words with regard to the development of the horse business. The demand for heavy horses has been tremendous during the past few years. In the year 1900 there were not, in the province of Nova Scotia, more than two or three registered, heavy draft stallions; to-day there are approximately seventy-five or one hundred, and I think the same condition prevails in other Maritime Provinces. This is all due to the effect of educational work carried on by the different governments, and also due to the fact that there are an increasing number of private individuals who know that pure-bred sires are absolutely essential to the improvement of our horses and who are trying to do something along that line, and fortunately with a great deal of success. I am glad to know that that question is going to be dealt with and that the government is going to encourage the men who, under somewhat unfavourable conditions, are investing large sums of money in pure-bred horses. We have bought some of the best in Canada—those that were prize winners at Toronto and elsewhere, and we have brought them to our province. The unfortunate feature, however, is that, under present circumstances, these horses are usually succeeded by grade stallions. This is a detriment to men who are investing their money in pure-bred stock, and I believe the situation is more serious with us than it is with you.

The Nova Scotia Farmers' Association unanimously passed a resolution that legislation should be enacted with regard to this subject. Never was a resolution passed more unanimously, and I have already conferred with the Premier of our province and he has agreed to present to the people a bill very similar to that which has been strongly urged by the Veterinary Director General. There is no doubt it will be a forward step.

The high-class horses that have been brought to the province have paid for themselves over and over again. We want to make it possible for private individuals to put money into high-class horses and to be in such a position that they will not have competition from these cheap horses, but will be able to reimburse themselves for the money they have invested. We must suppress the scrub or else we are going to stand where we are. I am glad to tell you that we have now established a Maritime Horse Show under the Maritime Stock Breeders' Association.

Now, I come to another matter which has already been referred to, and that is the beef cattle situation. Beef cattle have barely held their own in the Maritime Province during the last five or six years. The dairy cow, because she is a producer of wealth has been gradually making headway over her beef contemporary, and as a result, the situation has become somewhat serious and we are importing into the province more beef every year. When we talk to the farmers about it, they simply tell us that the pure beef animal will not pay for herself at present prices. If there were any way of promising the farmers that they would invariably get seven or eight cents a pound live weight for their cattle, it would be all right, but they say the price frequently goes down to five or six cents. The great thing that is needed is improvement in the milking qualities of our beef cattle and the cows must be of such a character that they will at least pay their board. A cow that does not give any more milk than sufficient to raise her calf will not pay for herself in our province. As that is the only way in which we can solve the question, we must pay more attention to the milking qualities of our beef cattle.

Now I come to the sheep industry and we will take second place to none in regard to the character of our country for raising sheep, yet the fact remains that the sheep business has not made progress during the past year. If anything, it has barely held

its own; in fact I am inclined to think it has slightly retrograded. There are many reasons to give for this, but I believe the fundamental reason is that while sheep require less attention than any other class of stock kept on the farm, yet the quality of the attention they receive must be of the very best.

Our people are inclined to think that if you have a flock of sheep you can simply let them range over the bare and poorly cultivated hills and they will look after themselves, but we have learned by sad experience that that will not do. Our people must be taught that, in order to keep sheep successfully, they must grow some succulent crop and must look after their pastures better than they have in the past. If, as a result of this report that has been brought in by the Sheep Commission of the Dominion Department of Agriculture, anything is contemplated in the way of giving demonstrations in sheep farming, I am convinced that a great deal of good will be the outcome and that the sheep business will again take hold in our country.

As to hogs, we have made progress corresponding with the improvement in dairy cattle, and one would naturally expect this.

In conclusion, I realize that you in Ontario have your attention largely fixed upon those countries farther west which are, at the present time, the centre of the greatest activity, but you do not realize what is being done in these provinces by the sea. Nevertheless, I wish to assure you that we are making no uncertain progress. We are teaching the young men how to judge live stock by holding short courses, and they are going back to their farms with the intention of keeping more and better live stock. I am convinced that after a few more years have passed, this movement, which is already well under way, will have good results. We have a country which is as good as you have in Ontario or any province farther west, and there is no doubt the Maritime Provinces will be an important factor in the live stock industry of Canada.

THE LIVE STOCK INDUSTRY ON PRINCE EDWARD ISLAND.

By Theodore Ross, Secretary for Agriculture for Prince Edward Island.

Four years ago I had the privilege of addressing you on the live stock situation on Prince Edward Island. I pointed out at that time that, although the conditions were not good, the foundations were being laid that would result in rapid improvement.

HORSES.

The number of horses in Prince Edward Island at this time is about 32,660, an increase of seven per cent over 1908.

Within the last three years upwards of one hundred Clydesdale mares have been imported direct from Scotland. Most of them have proved quite satisfactory. A number of excellent stallions, too, of the several breeds, among them, 'Labori Again' and 'Baron Kelvin,' are now in the province giving a good account of themselves.

On the whole, horse breeding is making satisfactory progress. There are more really good stallions in the province now than ever before and good judgment is being more generally shown in the mating.

CATTLE.

Marked progress has been made in the breeding of dairy cattle. At our last meeting I stated that there were scattered here and there over the province young men building up excellent herds of dairy cattle of the several breeds. Their influence has been more or less contagious and to-day the province is proud of its dairy cattle.

Last year there were in the province 13 Cow Testing Associations, having in all 156 members testing a total of 1,169 cows.

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There have also been entered in the Record of Performance Test 26 pure-bred cattle, one of which broke the world's record for a two-year-old Ayrshire, giving in 365 days 11,673 pounds of milk. Three other cows were being tested in the same herd at the same time, all of which have since qualified, one with 572.77 pounds of butter-fat to her credit. Seven-day tests have also been conducted for the Advanced Registry. In one herd three cows qualified with about 63 pounds milk and 2 pounds of butter-fat each per day to their credit.

But these are not to be regarded only as isolated instances of progress, they are indicative of the improvement that is taking place in dairy cattle generally.

In 1906 the total number of milch cows in Prince Edward Island was 45,550 and 32,083,640 pounds of milk were sent to the factory. In 1910, the latest year for which figures are available, while the number of milch cows was 50,115, or an increase of 10 per cent, the amount of milk received at the factories was 49,738,910, an increase of over 50 per cent.

This increase is not due to more factories being operated or to a larger number of patrons furnishing milk, but to better milch cows being better cared for. Moreover we are only at the beginning of the improvement. The next ten years will witness steady continuous development.

I regret to say that similar improvement has not been made in our beef cattle or sheep industries. They are just about where they were in 1908. The government made several importations of pure-bred rams and distributed them through the province, but so much injury has been done by dogs that people are continuing to go out of the business. The number of beef cattle in the province in 1910 was 49,975, of sheep 75,043.

SWINE.

We are continuing to make progress in hog-raising. The high prices of farm crops are, however, leading some of our farmers to market their hogs in an unfinished condition, to the detriment of the trade. A very large proportion of the prizes offered at the Amherst Fair for hogs, and particularly for bacon hogs, comes to our province. There are from 40,000 to 50,000 hogs raised annually.

POULTRY.

There has been a steady decline of late years, in the number of turkeys and geese raised, but the number of hens has increased very rapidly. Fattened chicken is now regularly offered for sale and a large export trade is being built up.

In 1907, the total value of the eggs produced was about \$250,000; last year it amounted to upwards of \$500,000, of which about 2,500,000 dozen were exported.

In conclusion, I would like to say that the live stock industry in Prince Edward Island is in a flourishing condition. The Department of Agriculture has for the last few years been paying particular attention to dairy cattle and to poultry. For the next few years more of its energy will be spent on its sheep and hog-raising. Our people are naturally good horsemen. It will be very difficult to improve the beef cattle situation in the province, which is almost wholly covered by co-operative cheese factories and creameries.

A general feeling of hopefulness prevails and the next ten years will witness a remarkable development of the live stock industry in Prince Edward Island.

PRESENT CONDITIONS OF THE LIVE STOCK INDUSTRY IN ONTARIO.

J. H. Grisdale, B. Agr., Director Experimental Farms, Ottawa.

I feel rather diffident this morning in appearing before members of the National Live Stock Convention to give a resumé of the present conditions of the live stock industry in Ontario. I feel diffident for the reason that I notice in the audience a

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very large representation of the best live stock men in this province, and I consider myself as hardly the right man to take up this question. I had nothing to do with the selection of the individual. I was ordered by telephone to do this, and if you have ever had the experience of being in the government service, you will know that you receive your orders and do the best you can. Therefore, if my remarks this morning are not to the liking of any of you, you will know that I have tried to outline what I thought was the actual state of affairs in this province. I shall try to give you as clear an idea of the conditions as possible. It is no little task for a man to size up the live stock situation in a province such as we have in Ontario, a country that has for many years stood amongst the best in the world in the live stock industry. As breeders in this province, we have been able to hold our own wherever we have sent our stock; we have been able in fact to stand at the top of the list and, for this reason, I say this province stands second to none in the live stock industry in the whole live stock world.

We hold the happy position of being a sort of hunting ground for the live stock men all over Canada and the United States. When a breeder wants a good animal, he sends his agent, if he cannot come himself, to the herds and flocks of this province of Ontario and, if one may judge by what he sees on the farms of this province and other provinces, he goes away satisfied. This sometimes proves a drain on our herds, but still it is something to be able to ship our stock to all parts of the world and to continue in the work. Not only are we a source of supply for all parts of the Dominion for live stock for breeding purposes, but I am sorry so say we find ourselves called upon to serve as a source of supply of cattle for meat as well for nearly every other province. This, of course, should not be. It is to our advantage to a certain extent, but we could have other markets just as remunerative and just as profitable if such were not the case.

We also hold the proud position of being a source of supply for men capable of carrying on live stock lines of work in other provinces. Go where you will in America, but especially in our own western provinces, and you will find that the best stock men, or many of the best stock men, received their early training in Ontario. Then, again, we have the advantage of being the centre of the different associations. I need not enumerate these; you are as familiar with them as I am. Live Stock Associations for many years were established in this province previous to their being nationalized as at present. We, therefore, have a long list of advantages which have given us the status that we now hold amongst the provinces of the Dominion and in the live stock industries of the world.

But the reasons for this prominence are not merely the ones to which I have referred. We have something further: The people of Ontario, coming as they did from the United Empire Loyalists and the early settlers of this country, selected from the best classes of England and Scotland and Ireland, brought with them the feelings, sentiments, inclinations and ambitions of the good old Anglo-Saxons and have transplanted these ambitions and feelings into this province, so that, although we have added to our population men of other derivation, we still have sufficient men with strong inclinations in this direction to imbue the whole people. Practically every farmer in Ontario finds himself by his genius, inclination or family connection interested in live stock, and men who have by some means or other acquired riches, often turn some of their wealth into live stock and start breeding operations. Further, I have travelled in Europe and I have travelled from one end of this Dominion to the other, and no where have I seen conditions which, on the average, year by year, can be compared with conditions as they exist in the province of Ontario, for all classes of live stock. We have a province remarkably free from disease; we have a climate which not only lends vigour and stamina and energy to our live stock and to our men, but it lends health as well, and owing to the rigour of its winters, many of the disease germs which might otherwise develop are destroyed. We, of course, have that dreaded

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disease, tuberculosis; let us hope that steps will be taken to stamp it out in the near future.

Another point which has helped us in this province is the American tariff, put into force some few years ago, which compelled a great many of our farmers to turn their attention to live stock, and on many farms where in past years they grew grain for the American market, they are now breeding live stock. Thousands of our farmers who previously thought of nothing but barley, turned their attention to live-stock feeding and, therefore, we are indebted to our American friends in no small measure for the success we have achieved in live stock lines. We are also indebted to them for a market, because, although they passed this regulation practically excluding our grain, they continued to admit our pure-bred stock duty free, and here was a line of operation where we had the best market in the world open to us. I am sorry to say it has been put under restriction recently, but, in my opinion, we owe our tremendous expansion along live stock lines in no small measure to the American market.

We are all more or less tainted with a little Scotch blood, and we all are interested in making a good penny, and I am safe in saying that there is no industry or no branch of farming which, if carefully and judiciously carried on, will give better returns for expenditure in the way of labour and money and energy than will live stock. Our government has done a great deal to help us along. We have our Live Stock Associations and Agricultural College, and men such as Professor Day and Professor Wade doing the best they can to improve and build up our herds and flocks and to improve our ideals in breeding. We have our Fat Stock Shows, eastern and western, and we are certainly making tremendous progress. Who cannot remember the little show we had here in Ottawa seven or eight years ago where we had but a handful of stock in many cases of poor quality, and then look at the Fat Stock Show we had in January last where we came nearly outdoing our western rival. Then we have the short course at Guelph and we are establishing short courses all over the province. These are going to have a wonderful effect upon the industry in this country. In addition we have the Farmers' Institutes where more or less work is done, and our Dairymen's Associations. The cheap transportation privileges we enjoy, which have helped advance our live stock interests quite materially, have been the result of work of the Ontario associations very largely, but, of course, in co-operation with the western provinces.

Now let me say something about the various classes of live stock found in this province. You will, perhaps, be interested in knowing the extent of improvement that has been made in the last ten or twelve years. Immediately after I was requested by the Live Stock Commissioner to do something on this line, I had a man go through the reports of the Live Stock markets in our principal agricultural papers and average up the prices month by month and year by year from 1900 to date. I took the Toronto markets as the markets which were most representative of the province. I began with horses, taking draft horses, general purpose horses and carriage horses and drivers. Let me give you a few of these figures. I will not undertake to give you all the details, but I can give you some interesting facts in connection with the trade as it is to-day and as it was twelve years ago.

In 1900, draft horses on the Toronto market averaged \$150 apiece, general purpose horses sold for \$125, carriage horses and drivers \$160. In making these averages, I did not include the worst horses but just average priced animals. The price for these different classes of horses has risen gradually. In 1904, it was \$200 for draft horses, \$160 for general purpose and \$240 for carriage. In 1908, \$200 for draft horses, \$170 for general purpose and \$250 for carriage and drivers; in 1910, \$235 for draft horses, \$210 for general purpose and \$350 for carriage and drivers; and last year, the price was \$325 for draft horses, \$250 for general purpose and from \$350 to \$400 for good drivers.

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The horse population has gradually increased. In 1900, we had 617,300 horses; in 1910, 724,384, an increase of 98,000. We have had more horses in the country than we have to-day. In 1905, we had 672,000. The estimated value of these horses as given by the enumerators was \$76 in 1900, \$110 in 1905 and \$136 in 1910. The increase in that time has been 108,000, or 17½ per cent. The population of Ontario increased 15.8 per cent during this period, so you see the horse has kept a little bit ahead of the human. Prices have been remarkable, instead of merely keeping pace with the times, the increase has been 80 per cent in the last twelve years.

Coming to beef cattle, I am sorry to say we have not been able to make quite such a good showing. In 1900, we had 1,500,000 beef cattle in Ontario, in 1910 we still had a million and a half beef cattle. There is a slight difference of about 50,000 more beef cattle to-day than there were in 1900. We are, therefore, not making much progress in this line. In 1900, the average price for the year, including all classes, that is exporters, butchers, stockers and feeders was 4.18. The average price in 1911 was 5.36. Prices did, however, reach a higher level than this for a time. By 1906, our beef cattle population had gone up to 1,834,571 but the price was very low, only 4.07. The highest price we have ever obtained for a year through, was in 1910, when it was 5.64, and exporters that year stood the highest of any record I can find, namely, 6.48 the year through. Butcher's cattle also stood very high that year, 6.32.

I have the figures of our export trade with Great Britain during the last six or seven years, and I will read them to you as an item of interest. Beginning with 1905, we shipped 148,718 from Canada. I could not get the figures from Ontario exclusively. In 1906, 160,759; 1907, 125,753; 1908, 121,076; 1909, 113,000; 1910, 78,000; 1911, 42,000. We have gone down very rapidly.

When it comes to dairy cattle, we have very few figures given except the population. In 1900, we had about 1,976,000; in 1910, we had 1,052,000. The price has very gradually improved. In 1900, about \$45 a head was received for the best dairy cow; in 1910, it went up to almost \$80; in 1911, it took a drop to about \$65. The outlook for the dairy industry appears to be very much better than ever before. The high-water mark in the dairy industry, as far as population of dairy cows is concerned, was in 1903, when we had 1,153,000 odd dairy cows which, according to the statistics for Ontario were worth \$36 a cow; and in 1910. the same statistician says they were worth \$41.

Sheep make a most unsatisfactory showing. In 1896, we had 1,849,000 sheep in Ontario and last year it is just a little over the one million mark. One point to which I would like to draw your attention in connection with the prices is this, that whereas the price for old sheep has not materially increased or improved, the price for lambs has steadily gone up. While there used to be about 50 cents difference between ewes and lambs, there is now a difference of nearly \$2 a hundred, showing that the people are becoming more careful of what they eat and are demanding lamb rather than old sheep.

In swine we have not made the retrograde movement that many people think. I was astonished in looking into it to find that the swine products exportation for 1910 was over \$23,000,000 from Ontario. We have sold far more pigs in previous years, in fact the smallest number of pigs sold was in 1910, but we got such remarkably high prices that we made more money by a good deal. The price in 1910 averaged 8.74; 1911, 6.82; in 1909, 7.51. In 1904, we sold our pork for 4.99. The greatest sales were made in 1905, when we sold 2,269,000 pigs. We have to-day a million and a half pigs in the province of Ontario. At one time we had a good deal over 2,000,000.

I will not say anything about poultry, because I do not think this convention is interested in that line.

I was not able to get very many figures in connection with the pure-bred side of our business, and I have to depend more on what I have observed year by year. I

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must say that I think, judging from the National Live Stock records and so on, that the different breeds are thriving and progressing. To give you a few figures, in 1908 the money received for registration purposes was \$27,000, and it went up gradually until in 1911, it was a little over \$50,000, showing an increase of about 33 per cent or 34 per cent. We registered in 1908, about 22,000 animals of the different breeds, and in 1911, we registered about 32,300, showing a decided improvement. I was unable to obtain any figures as to the prices but, judging from the reports one sees in the papers, they are holding their own. I think on the average, we may say that we can congratulate ourselves upon having held our own in our pure-bred live stock classes. We have made more than normal progress in pure-bred live stock population, and we have made much more than normal progress so far as number of breeders indicates progress, especially is this activity noticeable in several of the dairy breeds. This species of progress is, in my opinion, the best possible kind of progress to make and augurs well for the future.

Many of our sheep breeders continue to register in the American records and, therefore, our records are not exactly what they ought to be in that respect, still the numbers have not been quite as large in the last two years as they were in the earlier years.

In swine we have about held our own. The number of breeders of pure-bred swine has not materially increased and the number of registrations has not increased, but we have improved in quality.

When it comes to horses, which I have purposely left to the last, I do not feel that I am able to size the situation up in this respect quite as enthusiastically as our friend, Mr. Bright. He said that the horse industry meant more money than all the other live stock industries put together. There is, however, a tremendous amount of money and energy put into the horse business in Ontario and prospects are exceedingly good. Prices have more than doubled in ten years, and in view of the tremendous expansion of the western provinces are likely to continue to rise. When a man in the west wants a horse, he is practically compelled to come to the Ontario breeder who does not hesitate to ask \$500 for a good colt, and who will not sell his mares at all. A business that is in that happy position surely looks promising.

I hope you will find something of value in these few remarks that I have been able to make. I appreciate the fact that I am not the most suitable man to make them but I have done the best I could.

PRESENT CONDITION OF THE LIVE STOCK INDUSTRY IN SASKATCHEWAN.

P. M. Bredt, Live Stock Commissioner for Saskatchewan.

When I was asked about a fortnight ago by your Executive Committee to address you to-day as to the present conditions of the live stock industry of Saskatchewan, I was very reluctant in accepting this invitation, because I was very doubtful if any man could do justice in twenty minutes to this great subject. I, myself, felt that I was the last man fit to do so, because, while I have certainly during the last eighteen years—that means since my arrival in this country—always taken a great interest in the live stock affairs of the Dominion, and of Saskatchewan in particular, I feel there are more capable men in Saskatchewan and right here at this meeting than I am to address you. Especially is this the case when you consider the fact, that when I came to Canada, I not only had to first acquire knowledge of the live stock conditions of Saskatchewan, but also had to learn your language; I don't think I need to tell you that I am not a born Britisher, but I am what some of you would rather term a 'foreigner.' This, however, is a mistake, because I think that after taking—15 years ago—the oath of allegiance, I have become, not only by form

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but also by heart a true, faithful Canadian and British subject. So far as my ability to express myself in your language is concerned, I am hampered by the fact that I was too old when I started to learn English, and while I think that probably under other conditions, I could do full justice to the subject, the fact remains, that while the spirit is willing the flesh is weak—that means, in this case, my tongue and my lips. However, you will have to excuse this as it was your executive that asked me to address you to-day. There is another reason why I feel to-day not as capable as usual. I have had, during the last forty-eight hours, a very serious attack of nervousness, and while many of you know me and know that I am subject to nervousness, I am nervous to-day, and very nervous. You will, therefore, excuse me if, in some cases, I not only make use of my notes, but if I have to read part of my address. I never have done so. I have addressed meetings during the last thirty-five years of my life but I have never yet read an address, but I will have to do it this time.

Another thing you must excuse, I notice that Professor Cumming was asking the Live Stock Commissioner if he expected these remarks would be particularly sectional. I admit that my remarks will be sectional, and where they are not sectional take them to be sectional because I have to make some remarks that will be applicable to the whole west and are national.

Probably some of you will ask me if I have anything to say on live stock conditions in Saskatchewan, because while you may have heard about sunny Alberta as a great live stock country, you may have heard only about Saskatchewan as a great wheat producing province, in fact, as the greatest wheat producing province of the North American continent. It is true that Saskatchewan is producing more wheat than the rest of the Dominion of Canada put together, and it is also true that Saskatchewan is the greatest wheat producing province on the North American continent. I wish that, just for that very reason, it was also a very great live stock country. I say, I wish I could state that, since Saskatchewan is such a great wheat producing province, it was also a great live stock producing country. We all know that our soil never can go on forever producing such great crops if there is nothing done to restore or keep up its fertility, and live stock is the only means to do this. Now, I am sorry I cannot make such a statement, but I am glad that I am able to tell you that live stock conditions in Saskatchewan are not as bad as many of you may think, and I am especially glad to say that the government of Saskatchewan is using many means to stimulate an interest in the live stock industry of our province.

You all know that Saskatchewan was created a province in the fall of 1905, and the government, realizing the importance of a strong live stock industry, has tried ever since to encourage such an industry. The first thing they did was to create in the fall of 1905, a strong Provincial Live Stock Association, with the intention that this association should take hold of the live stock affairs of the province. This one association was soon divided into four Breeders' Associations—Horses, Cattle, Sheep and Swine—and certainly the work they have done is very gratifying. They first started out to hold an annual winter fair, at which fair not only the best live stock of the province and all neighbouring provinces were shown, but at which an important feature was the practical demonstrations by experts on the live animals and later upon the carcasses. Another important feature was in the judging rings, where the judges were asked—after having made the awards—to give reasons for their placing of the animals. For the young men, judging competitions were arranged, and in the evening lectures pertaining to live stock were given by the best obtainable practical live stock men and also by the highest learned authorities.

The winter fair was and is not the only work the associations did and at present are doing. The Sheep Association has started to hold annual sheep sales. The Cattle Breeders' Association is holding annual bull sales and the Horse Breeders' Association is encouraging the holding of regular annual stallion shows throughout the province.

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Regarding the bull sales, the cattle breeders have, up to the present, been holding only one bull sale annually at Regina, but upon my suggestion they have decided to hold from now on at least four different bull sales throughout the province. My idea was, that in such a large province as Saskatchewan, the holding of only one bull sale was not enough to stimulate the breeding of good cattle, because even with cheap transportation we could not ask all the farmers to come to one place. It was not so much the expense of travelling as it was consideration of the time lost in coming to one central sale which prompted my suggestion, that we should not ask the farmers to come to the bull sales, but that we should take the bull sales to the farmers. These bull sales have been started, not for the benefit of the producer, but for the buyer of bulls and for the improvement of the cattle in Saskatchewan. We have another object in view and it is this: we want to try to encourage in the districts we think the most suitable for beef breeding, the breeding of beef animals, and in districts that are more adapted for dairying, we want to encourage the breeding of dairy cattle, thereby creating good beef cattle districts and good dairy cattle districts.

Of course, the carrying out of this idea will involve a somewhat higher expenditure, but we are confident that both the Dominion and Provincial governments will give us their hearty support in such an undertaking, especially when I mention that we will not only have to stick to our principle of making the bull sales open to all the breeders of the Dominion, but we may even have to come east and ask eastern breeders to support us by sending bulls for these sales to Saskatchewan.

The Saskatchewan government found in 1905, that just a year before, the Territorial government had passed a Stallion Enrolment Act, and they immediately went to work and tried to enforce this Act. While this Stallion Enrolment Act has been in the past, chiefly an administrative measure, it still has done some good in informing the farmers what kind of stallions they were using—that means so far as pure breed or grade was concerned—and it has also encouraged the keeping of pure-bred stallions, because under this ordinance only men who travelled pure-bred stallions were able to take a lien on the foals for overdue service fees. It also has enabled the government to classify as to breeds all the stallions that are standing for public service in Saskatchewan, and it has also furnished the foundation for a new stallion ordinance, that is just now before our local legislature. This new stallion ordinance will be made optional with the municipalities of the province. If the municipal council passes a resolution to adopt it, then it will be compulsory for all the stallion keepers in that municipality to subject their stallions to an inspection. In that municipality then only those stallions will be permitted to stand for public service that have passed such inspection. Stallions affected with hereditary unsoundness or possessed of great defects of conformation will not be allowed to stand for public service.

The time is too short to go fully into this matter, but I wish to say that the Horse Breeders' Association of Saskatchewan will be, in a large measure, connected with this ordinance, since they are represented on the board and will encourage the municipalities and the owners of stallions to adopt the ordinance. Prize money in future should only be given to inspected stallions.

It may interest you to hear some figures regarding enrolment of stallions under the old ordinance. In 1905, eighty-seven pure-bred stallions and seventy-two grade stallions were enrolled, and the figures for the succeeding years follow.

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ENROLMENT of Stallions under the Territorial Horse Breeders' Ordinance of 1903.

Pure-Bred Horses.	1905.	1906.	1907.	1908.	1909.	1910.	1911.	Totals.
Clydesdale.....	56	85	78	111	186	250	218	984
Percheron.....	10	25	37	33	63	75	73	316
Shire.....	4	10	4	9	15	11	16	69
Standard bred.....	6	9	14	15	27	23	14	108
Hackney.....	1	6	4	10	12	9	6	48
Thoroughbred.....	2	3	1	1	5	5	6	23
French Canadian.....							1	1
French Coach.....	4		3	1	2			10
German Coach.....		2		1		2	2	8
Yorkshire Coach.....					1	1		2
Suffolk Punch.....	4	2	2	3	6	3	3	23
Cleveland Bay.....		1						1
Belgian Draft.....		1	4	1	5	15	14	40
Jacks.....					1			1
Saddle Horse.....						1	2	3
Irish Hunter.....							1	1
Total.....	87	144	147	185	324	395	356	1,638
Grades.....	72	115	130	186	350	290	333	1,476
Total enrolment.....	159	259	277	371	674	685	689	3,114

Just recently the Saskatchewan government also appointed a Live Stock Commissioner, whose chief duties will be to have under his control all measures intended for the improvement of the live stock industry of Saskatchewan. He should be the executive head of the Live Stock Associations and of the new Stallion Inspection Ordinance. He will also have to see to the improvement of transportation, that means to try to arrange not only for cheaper but for more rapid and satisfactory transportation. He will also have to initiate and encourage movements for better marketing methods and better markets. In short, his office should be the centre of all the practical movements for the improvement of the live stock industry in Saskatchewan, and he will naturally assist the Dominion Live Stock Branch in all matters undertaken by it for the betterment of the live stock industry.

Before I pass on to give you figures to show how all these different measures of the government have succeeded in stimulating interest in the live stock industry in Saskatchewan, I shall not forget to mention one very important industry, the dairy industry, that has been fostered by the present government through the creation of a dairy branch. When Saskatchewan was created a province there were four creameries under the control of the old Territorial government, but very little interest was shown by farmers. This is proven by the fact that only 213 farmers were supporting these creameries and the output was only about 65,000 pounds a year. The Saskatchewan government created a very strong dairy branch under a capable superintendent. It also engaged two dairy instructors and supported the dairy farmers in cow-testing measures. It has also started to hold annual dairymen's conventions, and has succeeded so well in stimulating interest in dairying that to-day we have nine big creameries under government control besides five other big private creameries.

The output of the nine government creameries has risen from 65,000 pounds in 1905 to approximately 700,000 pounds in 1911, and including all the fourteen creameries to 1,000,000 pounds.

In the early days of creameries in Saskatchewan, there were no winter creameries, but in 1907 the first start was made to encourage creameries to keep open during winter, and to-day four creameries under government control have an output of butter during the winter season equal to that of the annual output of all the creameries

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under the old Territorial government. While in 1905, only 213 farmers were patronizing the government creameries, now over 2,000 farmers are patronizing them.

This is certainly a very encouraging fact and we hope, if we are able to carry out the plans I have mentioned regarding bull sales of dairy breeds in dairying districts, to give further encouragement to the dairying industry. The Saskatchewan Local House has also voted every year quite a considerable amount for the interest of the live stock industry; in fact, they have annually increased this vote so that we are able to do a little more each year. Now you will ask me what effect all these measures have had regarding the actual figures of live stock in Saskatchewan, and while they are not as gratifying as I could wish them to be, they are not entirely discouraging.

The following table shows the number of each kind of live stock in Saskatchewan in 1910 by crop districts:—

Crop District.	Horses.	Milch Cows.	Other Cattle.	Sheep.	Swine.	Poultry.
1 South Eastern.....		66,388	126,277		101,995	1,352,701
2 South Central.....	73,850	15,742	37,141		43,314	709,734
3 South Western.....		6,000	60,488		7,276	183,705
4 East Central.....	66,915		132,500		56,805	740,938
5 Central.....			75,570	6,165	72,062	1,008,326
6 West Central.....		6,948	17,887	544	13,632	196,843
7 North Eastern.....	4,320		10,195	815	4,673	58,772
8 North Central.....	22,979		42,767	5,912	18,426	200,046
9 North Western.....	16,841		24,480	895	10,863	175,053
Total for Province....	184,902	95,078	527,305	14,331	329,046	4,626,118

- TABLE showing the increase in numbers of Live Stock from 1901 to 1910, inclusive.

Year.	Horses.	Milch Cows.	Other Cattle.	Sheep.	Swine.	Poultry.
1905 (estimated).....	190,000	90,000	310,000	111,000	100,000	.....
1906.....	240,566	112,618	360,236	121,290	123,916	.....
1908.....	343,863	179,722	565,315	144,370	420,579	3,411,062
1909.....	429,776	253,548	594,632	152,601	352,385	4,343,643
1910.....	552,374	224,745	527,305	164,855	329,046	4,626,118

If we ask ourselves whether these figures I have just given you are really satisfactory, then we have to admit that while they are not entirely discouraging, they are not satisfactory, especially if we compare them with the tremendous increase of the grain growing industry. To make this plain to you, I will give you just a few figures comparing the growth of the grain growing industry and the growth of the live stock industry.

WHEAT.

Year.	Total No. Bushels.
1905.....	26,000,000
1910.....	93,000,000

OATS.

1905.....	19,000,000
1910.....	103,000,000

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BARLEY.

1905.	1,000,000
1910.	6,500,000

FLAX.

1905.	500,000
1910.	5,500,000

1910 field crops were valued at 92½ million and live stock at 102 million dollars, and in addition to these facts we have to consider that the figures given for grain growing represent practically the yearly revenue out of the soil, while the live stock values represent the total value of the existing live stock.

If you were to ask me how much money Saskatchewan has derived out of export of live stock, I could hardly put it higher than about \$3,000,000, while the profits derived out of export of grain are at least \$50,000,000. These figures alone will show you what tremendous wealth and fertility is taken annually out of the soil of Saskatchewan and sent away, and I do not think that I am saying too much, in the face of these big figures, regarding grain production and the small figures pertaining to live stock production—when I state that our Saskatchewan farmers at present are robbing our soil of a tremendous wealth. I think it is high time that some stop should be put to such farming methods, because the farmers are not only robbing themselves but they are robbing the coming generation and the community at large. This fact has already been realized by men of good judgment, but the great bulk of the farmers still keep on in their old way of exploiting the soil of Saskatchewan.

I wish that we could induce the farm papers of Canada to have every week at least one editorial article setting forth to the western farmers the importance of changing their farming methods and of starting what we generally call mixed farming. I know that quite a few such appeals have been made by the papers and have been made by men who have seen the situation clearly.

Just the other day I saw a short item in one of the leading western farm papers written by a western farmer which reads as follows:—

The live stock industry of the west is, so far as I am able to judge, not even holding its own in spite of the tremendous progress which the country is making, and if things are allowed to go on as they are doing for five or ten years longer, much of the rich wheat land will be completely exhausted, while, with climatic conditions to be encountered, it will be a matter of many years and much difficulty before the fertility can be restored. The average annual yield of wheat, even with frequent summer fallowing, is to-day on the Portage plains scarcely one-half what it was when the land was first broken and, with the history of the rest of this continent behind us, it seems to me that no effort should be spared to induce our prairie farmers to go in strongly for live stock and mixed farming before it is too late.

I am glad to see that now at some of our grain growers' meetings the grain growers are also discussing the subject of mixed farming, and the keeping of more live stock.

Should our Saskatchewan farmers not believe their own countrymen, but prefer some outside opinion, according to the old saying that the prophet is not without honour except in his own country, I can give them just a few lines taken out of a prominent American paper. The little item reads as follows:—

Canada has gone to growing grain, and is so neglecting stock that it is buying of us and is likely to continue doing so; we are convinced that this is a wrong turn to take, for if Canada is anything that is distinctive it is that it is a natural grazing country, and some fine day the discovery will be made that it

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is live stock and not grain that makes land rich. As it looks now, the Canadian Northwest is following exactly in the footsteps of our own prairie states, which in their turn followed the eastern states in using up the surplus soil fertility as soon as possible, making all haste to turn it into money, and then hunting for more soil somewhere to serve in the same way.

Now, I do not think I need say anything more to prove to you how important it is to stop the present system of farming in Saskatchewan and the western provinces. Their present way of farming—at least the way 90 per cent of all the western farmers are farming, should be made a criminal offence and put, if possible, in the criminal code, but we all know that this is impossible, and for this reason we ought to try and find some means to reach the western farmer and to point out that after all the keeping of live stock will be the only means of maintaining the fertility of the soil. If you ask me what we shall do to make such a change of conditions and how we can improve and stimulate the live stock industry of Saskatchewan and of the Dominion as a whole, I could probably tell you, 'Oh, let us go to the government and ask the government to put a duty on such and such a thing and take the duty off such and such another thing and give as a grant of \$50,000 for one thing or \$100,000 for something else, and then let us just sit quietly in our chairs, fold our arms and see what good will come out of it for us.'

I am sorry I will have to disappoint many live stock men in Saskatchewan and in Canada by not falling in line with such a proposition, because, while I certainly know that we must have legislation regarding such matters, and while I also know that we must have government support, I claim that first of all the live stock men of Saskatchewan and of Canada have got to show that they are alive themselves and that they are willing to do something themselves.

I think, Mr. President, the remarks of the Honourable Minister of Agriculture in the Dairymen's Convention of Ontario, when he told the dairymen that the government was certainly willing to assist them in every way possible so that *they could help themselves*, goes right down to the very reasons why our live stock industry is not what it should be, and it shows us clearly what we, on our part, should do as live stock men. Many of us are relying too much on government help, and are only too willing to accept government assistance without making strong enough efforts ourselves to use this assistance in the right way.

The breeders in the districts of Canada, or more especially in Saskatchewan, could do very good work if they would join together in the different breed districts in a co-operative way, and I believe that the different breeders' associations could employ many means not only to improve the several breeds but also to stimulate the interest in these breeds. As it is at present, I find that in most meetings of these associations, only routine business is done and very little actual work is accomplished. Some may pass a few resolutions but very few will settle down to discuss actual means as to how to improve the breed and how to create a greater interest in the breed.

To illustrate my point, I wish to mention an incident that happened about a week ago at one of the breeders' meetings in Toronto. After the minutes of the last meeting had been read and after the grants had been voted and other routine business completed, the president read his address—an address full of valuable thoughts and suggestions for the improvement of this particular breed. After he had read his address, the meeting passed on to the election of officers, and during the counting of the ballots, one of the members stood up and made some remarks of appreciation regarding the address. Others followed and enlarged on these remarks of appreciation, but with this practically the whole interest in the address ended. It might reasonably have been expected that at least some committee would have been appointed to report at the next meeting on the address, or even better, right at the same meeting or at a special meeting for that purpose.

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Of course, I am certain that we also must have the most hearty support of the Local government as well as of the Dominion government if we want to improve the conditions regarding live stock; in fact, I think it is only through the united efforts of the two governments that real good can be done for the live stock industry. All the means of stimulating live stock interests which I have mentioned before as being employed at present by the Saskatchewan government should still be used and even improved on. There should also be started a strong educational campaign throughout the country, not only to teach the farmers the importance of keeping of good live stock, but also to keep the farmers informed regarding the different breeds and the most suitable breeds for their districts. They should also be kept posted regarding the most up-to-date breeding and feeding methods. Steps like the one taken by the Dominion Department of Agriculture regarding the sheep industry are highly to be commended.

Furthermore, I think the governments should pay a little more attention to the keeping of good live stock on their experimental farms in the various provinces; in fact, should probably start some demonstration farms on mixed farming methods in the different districts. Last but not least, every government, Dominion as well as Provincial, should have a strong live stock branch with great and extensive power and authority, because we should remember that grain growing and live stock are equally essential for agriculture, and for this reason live stock interests should be put on an equal footing with grain growing interests.

I am sorry, Mr. President, that I have taken probably a little more time than was coming to me for this address, but my great love for live stock in general, and for Saskatchewan live stock in particular, has made me do so. I have given my report conscientiously just as conditions are, knowing that we are not assembled here to solicit favours on behalf of our own affairs or of those of other people, but to learn what are the actual conditions. While I, in consequence of this, had to show many dark spots in our live stock conditions, I was also able to show and report on many bright things. Where there is light there are shadows everywhere in life, and the live stock conditions of Saskatchewan, while they are by no means what they should be, are not at all hopeless. On the contrary, I think if the means used at present are continued and improved upon and other new suggestions accepted and added to them, that the man who will have the honour to report at a future National Live Stock Convention on this subject should be able to tell us of the great growth and progress made in the conditions of live stock husbandry in Saskatchewan.

I thank you, Mr. President and gentlemen, for the honour you have done me in asking me to report to you on this matter, and I must ask your forgiveness for the poor way in which this report has been given. I am sure there are many men present here from Saskatchewan who could have done this in a much better way than I have, and I hope the next time a more capable man will be in my place. There is one thing, however, I am sure of—no other man will be able to make his report in a spirit of greater or more ardent love for the live stock industry of Saskatchewan and the whole Dominion than I have done. I hope that you have felt this right through my whole report, and that for this reason you will excuse me if I have at times used strong language, because I think that very little good can be accomplished if we handle these present conditions with gloves. Strong measures and strong language are needed, in my opinion, to wake up the careless and indolent farmers of the west (for I speak only for the west.) We want to succeed in making the live stock industry of the west, and more especially of Saskatchewan, what it ought to be. 'Succeed we must,' this should be our guiding star.

Meeting adjourned.

SÉCOND SESSION.

Mr. ROBERT NESS, President of the Association, in the chair.

The CHAIRMAN.—I will ask the secretary to read some communications before we commence the proceedings of this afternoon.

Mr. A. P. WESTERVELT.—I wish to give you some information as to what was done at the meeting of the executive this morning with regard to some additional associations that will be represented at this meeting. Applications were received from several provincial associations that had not previously been affiliated. These associations are as follows: Saskatchewan Horse Breeders' Association, Saskatchewan Cattle Breeders' Association, Saskatchewan Sheep Breeders' Association, Saskatchewan Swine Breeders' Association, Ontario Sheep Breeders' Association, Ontario Yorkshire Swine Breeders' Association, Ontario Berkshire Association, Maritime Farmers' and Dairy-men's Association and the Maritime Sheep Breeders' Association. It was recommended by the executive that the applications be accepted. We also received applications from some associations in Alberta: the Alberta Provincial Cattle Breeders' Association, Alberta Provincial Horse Breeders' Association, Alberta Provincial Swine Breeders' Association, Alberta Provincial Sheep Breeders' Association. These applications from Alberta were considered by the executive but the applications, unfortunately, were not quite in the form prescribed by the constitution. Mr. W. J. Stark is secretary of these associations and a resolution was passed, pending the approval of the associations that I have just named, that Mr. Stark should be added to the list of membership for this year. The ordinary representation would be: president, vice-president and secretary, but this information was not available. Mr. Stark is here as secretary of the associations, and it was decided to recommend that these associations should be represented by Mr. Stark.

It was also recommended that Mr. Hull, of Kamloops, should be made a member of the association. These are the recommendations of the Executive Committee.

(Moved by Mr. Graham, seconded by Mr. J. E. Brethour, that the recommendations as read by Mr. Westervelt be adopted. Carried.)

Nominating Committee.—Professor M. Cumming, Lieut.-Col. Campbell, Mr. John Bright, Dr. J. A. Couture, Mr. W. W. Ballantyne, Mr. John Scharff, Mr. Paul Bredt, Mr. George Lane, Dr. Tolmie, Mr. Theodore Ross.

Committee on Resolutions.—Mr. William Smith, M.P., Mr. A. W. Smith, Mr. N. Garneau, Mr. C. A. Archibald, Mr. James Telfer, Mr. Theodore Ross, Mr. William Duthie, Mr. Robt. Sinton, Mr. George Lane, Mr. Alex. Davie, Col. Campbell, Col. McEwen.

Committee on Constitution.—Mr. A. W. Smith, Mr. H. S. Arkell, Mr. Robert Miller, Mr. Peter White, Mr. A. P. Westervelt.

The CHAIRMAN.—The resolution proposed by Mr. Bright this morning will go to the Committee on Resolutions.

Col. McCRAE.—I think we had better pass it.

The CHAIRMAN.—It was put to the meeting this morning and carried.

We have a telegram from the Vancouver Horse Show Association and considerable correspondence. I would suggest that it be handed over to the Committee on Resolutions. (Carried.)

Mr. R. REID.—I move that a committee consisting of the delegates representing the different dairy breeds, take into consideration all matters pertaining to dairying and dairy breeds and report to the meeting to-morrow. I take issue with the

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statement made this morning that there is more money in the horse business than in any other live stock industry in Canada. I think it is the money from the dairy industry that makes the mare go.

(Motion seconded by G. W. Clemons.)

Dr. RUTHERFORD.—I would like to have a little more light on this procedure. This convention is called for a specific purpose and we have a very full programme. What is the particular object of these motions? The dairy interests have received every consideration on the programme.

Mr. GEORGE LANE.—I think the reason Mr. Bright asked for his committee is in order to get a better understanding of the horse situation.

Col. McCRAE.—I think it is all right to have these committees. They will have plenty of time to meet and make their report after the meeting this evening.

Mr. REID.—It is the intention of the dairymen to meet at the close of the meeting and not to interfere with the programme.

A MEMBER.—I move that the order of business as indicated by this programme be followed. (Motion seconded and carried.)

The CHAIRMAN.—I now have much pleasure in calling upon Dr. J. A. Couture, of Quebec, to address the convention on the 'Present Conditions of the Live Stock Industry in Quebec.

PRESENT CONDITIONS OF THE LIVE STOCK INDUSTRY IN THE PROVINCE OF QUEBEC.

By Dr. J. A. Couture, Quebec.

Four years ago it was my privilege to address the second convention of the National Live Stock Association upon the same subject that is assigned to me to-day. In order that we might be judged more fairly, and consequently more favourably, I then thought it advisable to briefly outline the history of the live stock industry in the province of Quebec from 1750 to 1880, summing up the situation as follows: 'Quebec has devoted itself to dairying, the raising of a general purpose horse, the production of bacon, but is lamentably neglecting sheep raising.'

Our situation cannot have changed much in four years. However, it has been modified to a certain extent, and it may be profitable to ourselves and interesting to others to examine it under present circumstances. I will endeavour to perform that task as briefly as possible.

As I have just mentioned, Quebec has devoted itself, since 1880, to dairying, which policy has produced the most gratifying results, and improved considerably the condition of farmers. Thus, the production of cheese, which was only 512,436 pounds in 1871, amounted to 80,630,199 pounds in 1901, while our production of butter increased during that period from 24,000 pounds to 43,000,000 pounds.

Cheese making and butter making has been, until recently, the watchword of our farmers. The cows of the province numbered 328,000 in 1881, but they will probably number much over 1,000,000 in the pending census report. The milk production per cow has also greatly increased. There were only a few cheese factories in 1871. In 1910, according to the official bulletin published last summer by the Department of Agriculture, the cheese factories, creameries and combined factories numbered 2,165.

This marvellous development of dairying could not but be accompanied by an improvement in general farming, and could not fail to make our agriculture relatively prosperous. Thus, in 1895, the farm products of the province were double the quantity they had been in 1880; in 1910, they were double what they were in 1895.

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Several counties where, in 1895, hay only was grown export, at present, just as much hay as in 1895, besides dairy products for which they receive as much money as they got for their hay.

In some other counties, as in the Eastern Townships, dairying has completely changed the condition of things. Twenty years ago there were, in that section of the province, not to speak of the Cochrans and Popes, several breeders of pure-bred Shorthorns and Herefords. Moreover, most of the farmers, at that time, kept non-registered, but pure-bred milking Shorthorns, which were in great favour with the milkmen of Quebec and Montreal. They were good cattle, and it is a pity that no record book has been opened for them. In the eighties 3,000 head of these cattle were sold annually for beef in Montreal. There are now no more of these cattle in the Eastern Townships, they having been replaced by the Ayrshires and Holsteins. As regards pure-bred Shorthorns and other beef breeds, we have at present but a few herds.

With the expansion of dairying the farmers have favoured the Ayrshire, Holstein and French-Canadian breeds of cattle, especially the two former. Ayrshire cattle, both pure-bred and grade, are by far the more numerous. They may be found in all parts of the province, even the remotest, and are becoming more popular every day. This is due to the fact that our breeders of that class of cattle are among the most renowned of North America, and also to the large number of Ayrshire cows that are being tested every year with excellent results in the Record of Performance. I may say in passing that there are 730 breeders and owners of pure-bred Ayrshires in Quebec.

The Holstein cow has gained much ground during the last four or five years, thanks to their being well advertized in the press and the show ring, and to the wonderful performance of some of them. Many people think that all Holstein cows will give 20,000 pounds of milk in a year and this idea favours purchases. I am informed by Mr. Clemons that there are 120 members of the Holstein Association in Quebec. The number of grade Holsteins is steadily increasing.

The French-Canadian cattle are not increasing much in numbers in comparison to the two other breeds. They are not advertised properly; the fact is they have never been advertised and there are not enough records of herds and of individuals. Recently they have become popular with the wealthy city people, and several Montreal millionaires have gone in for these cattle. But it cannot be said that they gain much ground. There are 150 herds of pure-bred French-Canadian cattle in the province.

The Jerseys are decreasing in numbers; the Guernseys are stationary.

Summing up the situation as regards cattle, I would say that we no longer keep beef breeds of cattle; that, practically, all the cattle in the province belong to the three dairy breeds already mentioned; that the Ayrshires are foremost in the race, the Holsteins are good seconds and the French-Canadians are keeping the rear.

HORSES.

Previous to 1893, we had gone in to some extent for the Standard bred, to a less extent for the French Coach, but more generally for the draft horse, not to speak of the French Canadian horse, which the French Canadian Horse Breeders' Association was endeavouring to preserve and improve.

You are all aware of what happened in 1893. The numerous horse ranches, which had been in existence for about five or six years, sent thousands and thousands of horses to market. Electricity was substituted for horses as traction for street cars, and the tramway companies threw 500,000 horses on the market. Horses got so cheap in this province that farmers entirely gave up raising them, and, for ten years they hardly gave a thought to horse-breeding. Whenever they wanted a horse they bought him from the traders. In several sections of the province, as for instance in the

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counties of Chicoutimi, Lake St. John, Saguenay, Charlevoix, in the lower part of the province south of the St. Lawrence and in the neighbourhood of cities, that same condition of affairs still prevails more or less.

With but a few exceptions, as in the counties of Beauharnois and Huntingdon where the draft horse has been raised for the last forty years, horse-breeding has been carried on in the most unsystematic and haphazard way, the small French-Canadian mares being mated for a time with stallions of the various draft breeds, then with the Standard bred, then again with the draft horse. The result has been that we have no horses to speak of, with the exception of the incipient French-Canadian breed, which is being made up by the French-Canadian Horse Breeders' Association.

As regards that new breed I may say that it would perhaps be more proper to call it the *Canadian breed of horses* since the old breed of French-Canadian horses is now almost extinct and cannot be resuscitated. But something approaching to it is being made up.

The association has selected several hundred good, very good, sound and active mares of the same type, most of them presenting many characteristics of the old breed, weighing about 1,100 pounds and standing between 15-1 and 15-2, which are being used as foundation stock, and which will be mated with stallions of the same type. A large number of these mares are found in four sections of the province, namely, one comprising the counties of Montcalm, Joliette and Berthier, another comprising St. Hyacinthe and Bagot, a third comprising St. Johns and Iberville and a fourth comprising Gaspé county.

The association is making arrangements to secure stallions which will be placed for service in these four sections alternately. Others of the same stamp will follow until the type is permanently fixed.

Surely it will take some time before the breed is made up, but the association knows exactly what it wants, what it is aiming at and what should be done to make up the breed, and, if it perseveres in its efforts, there is no reason why it should not succeed.

Outside of these four sections of the province the draft horse will, in the long run, predominate, for the Clydesdale, the Percheron and, recently, the Belgian draft horse are much in favour almost everywhere. It will, however, take a long time before we have a class of good uniform drafters, unless farmers are taught to carry on horse-breeding in a systematic way, and this should be done as soon as possible.

The Canadian National Bureau of Breeding has begun a useful work in placing Thoroughbred stallions at the service of breeders and farmers at a nominal fee. Up to now only a few of them have been placed in Quebec, but the number will increase as the bureau's work goes on. This should have a beneficial effect upon the light horse industry of the province, and should be encouraged especially for those sections where the French-Canadian mares are most numerous.

The marvellous development of dairying, together with that of the textile industry, caused our farmers to neglect sheep-raising. Formerly clothing was made at home and every farmer kept a small flock of from ten to twenty sheep for that purpose.

The times have changed and the sheep industry has declined considerably owing, mainly, to that comparative prosperity brought on by dairying, and which seems to have put in the farmers' minds that it is foolish nowadays to bother about sheep; owing also to dogs in some localities, and to the low price of wool and mutton.

The official figures for July last give 533,400 sheep for the province of Quebec. But I would be much mistaken if there are more than 250,000.

My calculation is as follows: There are seventy-four counties in the province. From that number must be deducted seven city ridings, four adjoining the cities and six others where no sheep are raised. That leaves fifty-five counties or 1,100 parishes where sheep are being kept. Let us say that twenty persons in every parish keep ten head each (that is certainly an exaggerated estimate), and we have a total of 220,000

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sheep for the whole province. But whether we have that number or 500,000, we should be keeping ten times more.

However, it is gratifying to be able to say with Messrs. Dryden and Ritch in their report, 'That there is a nucleus, both of inclination and of practice around which it should not be difficult to build up an extensive and satisfactory trade in mutton and wool. The taste of the farmer is by no means averse to the ownership of a small flock, and there is that in the style of his life and work which peculiarly fits him to give that flock good care. It is questionable if a careful, systematic campaign, in the interest of sheep-keeping, would anywhere give better results than in Quebec.'

My time is too limited to discuss the possibilities for sheep-keeping, on hilly and level land, in Quebec. Suffice it to say that those possibilities are great, that the breeders' association is fully aware of them, and has a definite, comprehensive and practical policy which has been outlined in my last report to the Live Stock Commissioner.

That policy has three objects in view. First—to carry on a campaign of education upon sheep-raising; Second—to induce every farmer to keep a small flock of not more than ten ewes; Third—to advise the farmers of one section (parish or county) to keep sheep of the one breed or, at least, of the one kind (long woolled or short woolled). In connection with the latter suggestion I might say that the farmers of a section of the Lake St. John county have already agreed to keep on breeding with short-wooled sires, so as to gradually render the flocks uniform.

That policy can be carried on in two ways: First—by holding annual sales of pure-bred breeding stock, so as to help improve the flocks already existing; Second—by supplying *free* one ram to each club of five members who are not already keeping sheep but who will get at least five ewes each.

The object of the public sales is two-fold. First—to give those who already keep sheep an opportunity to get good sires, at a reasonable price, and without loss of time and unnecessary expense; Second—to give breeders of pure-bred stock a chance to sell, at a profitable price and at a determined period, all the good stock they can raise.

The public sales have been established and have proved successful. One was held in 1910, when 123 sheep were put up for sale. They were sold at a loss of \$2.63 per head. Another was held last fall when 193 sheep were sold and realized a profit over the purchase price of \$349. In both cases the demand was larger than the supply. This year the association will put up for sale 300 head.

The association is enabled to make these sales through the help given by the Federal and Provincial governments; the former paying for the transportation of the animals from the points where they are bought to those where the sales are held; the latter assuming the deficit caused by the expenses incurred in connection with the purchase, the sale and the shipping of the animals to the buyers.

The second part of the programme, viz., the furnishing of pure-bred sires *free*, to clubs, is being considered by the Provincial Department of Agriculture with good prospects that it will be approved.

But to make a success of the undertaking the beginners would have to be instructed and encouraged. Therefore, arrangements would have to be made to secure the services of expert shepherds, whose duty it would be to educate the farmers so as to prevent failures, which would tend to discourage not only those who failed but others also. The undertaking must be a success from the start.

If that programme is carefully followed, Quebec will have within the next ten years tenfold the number of sheep she has at present.

There is not much to be said as regards swine. Some fifteen years ago it looked as if our farmers would take to the production of the bacon pig, as they had taken to dairying. But for some reason or other they gave up the undertaking as unprofitable, and they remain satisfied with supplying local markets. However, they are willing to improve their stock and they are improving it mostly with the Yorkshire and Chester.

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The Stock Breeders' Association has undertaken to stimulate the swine-breeding industry, and, with that end in view, has inaugurated its annual sales of breeding stock, of which two have already been held. At the first, 64 animals were put up for sale and there was a deficit of \$65. At the second 93 head were sold and there was a profit of \$1. The third sale, which will be held next fall, will comprise 150 animals.

We are confident that these public sales will be sufficient to gradually increase the number of swine, until a profitable market is found for the surplus production, which cannot but be realized as the result of the association's work. At present that market is wanting.

Before leaving the subject I might say that no other province of the Dominion is better prepared to accept and put into practice a programme having in view the development of animal industry, provided it is started on right lines, and provided also that the Dominion and Provincial governments work hand in hand with the Stock Breeders' Association.

PRESENT CONDITIONS OF THE LIVE STOCK INDUSTRY IN BRITISH COLUMBIA.

Dr. S. F. Tolmie, Victoria, B.C.

I have been requested by your directors to say a few words regarding the present live stock conditions in British Columbia. In the limited time allotted to me, I will not be able to go thoroughly over the subject.

I come from a province that is about 800 miles long and 600 miles wide. British Columbia for many years to come will be a great consumer of live stock products. I will quote, therefore, the market prices as I go along. With the great development going on west of the mountains, both in the way of opening up fresh areas and in building railways and the general prosperity existing out there, it is no matter for surprise that British Columbia has proven a very profitable market for live stock products. The increased cost to the consumer has been a cause of complaint from some quarters, but when one takes into consideration the fact that the farmer out there is paying bigger wages to-day than he ever did before, and that the consumer is enjoying better times than he ever did before in the history of British Columbia, I do not think the farmer is getting too much for his products.

Looking to the future, I think the market is going to increase at a rapid rate. Our resources other than those relating to agriculture are very great. We have huge areas of timber land, valuable fisheries and mines. Our agricultural land is rather limited in comparison, and at coast points it requires a good deal of money to bring the land under cultivation. It is pleasant to know that our pure-bred stock breeders are keeping up-to-date. The exhibits of pure-bred stock at our exhibitions have been greater than in any previous year and of a better quality. Among other things exhibited this year was a Holstein cow, bred in British Columbia, that was yielding nearly 100 pounds of milk per day.

The Provincial government is showing a very lively interest in the development of agriculture and they have established a farm at the Fraser river, consisting of about 1,000 acres, which is in connection with a hospital for the insane. They have equipped this farm with high class Clydesdale horses, Hackneys and Thoroughbreds, and they have placed on it a first-class herd of Holstein cattle and have put up buildings of the very latest design. They propose conducting it as a demonstration farm so that it may be visited by the British Columbia farmers at any time. They also intend to hold annual sales of stock where the farmer can obtain the very best. It is difficult to estimate the immense value it will be to the live stock breeding interests of British Columbia.

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Looking at British Columbia from a live stock standpoint, it would be well to divide it into two sections. First we have that section lying to the west of the Cascade mountains, including the islands of the coast. In this area we have sufficient rainfall to carry on agricultural pursuits. In the valleys lying to the south of the mountains, we do not have sufficient rainfall to obtain the best results and we have to irrigate the land. When I refer to the range country, you will know it is that section in the valleys to the east of the Cascade mountains.

There has been a very strong demand for draft horses in British Columbia for some years past. Horses that were suitable for working purposes have been bought at very good prices. At the present time, horses running from 1,400 pounds to 1,550 are sold for from \$500 to \$700 apiece. If they weigh 100 to 200 pounds more they will run to \$900 apiece, and a horse weighing 1,800 or 1,900 will bring as high as \$1,000 or \$1,200. We also have a fancy market for high class, smooth, nice quality, well-mannered and well matched horses. These are bought by big farmers out there who compete at our horse shows and they pay as high as \$1,600 per team. Owing to the fact that the market has been pretty well supplied during the past year and that our American friends are shipping in very good teams, the demand is not nearly as good as it was a year ago, and I would advise any of you who are contemplating shipping horses to investigate the market before doing so. The ranches of British Columbia are noted for producing horses of very good quality that will stand hardships, that have excellent feet and that are remarkably well muscled, but, owing to the fact that the foundation stock is not well selected, that the horses are produced on wholesale lines and are not given much care, they are not supplying the demand.

An institution that is most urgently needed in the range country of British Columbia is an experimental farm where experiments could be carried on in connection with farming under irrigation conditions and where experiments could be conducted with plants which thrive well in arid or semi-arid regions in other parts of the world and where experiments could be carried on with pumping plants for irrigation purposes. There is no trouble in securing capital to bring water twenty-five or fifty miles where you have plenty of land to be irrigated, but there are many parts of British Columbia where there is not enough land to grow hay to sustain the stock through the winter. If water could be put on the land at low cost by machinery that would pump it from the river, a good profit could be made. Years ago when cattle were first put on the ranches, the grass was twelve to fifteen inches high and there was plenty of it. The cattle at that time would fatten very rapidly, but the ranchmen over-stocked the ranches and they are not nearly so valuable as they were years ago. Experiments might be conducted along the line of re-seeding these ranches. The greatest drawback to the successful production of live stock on the ranches of British Columbia to-day is the inability of the rancher to produce sufficient feed to carry his animals over the winter at low cost.

While it must be admitted that the automobile and other mechanical devices have cut in on the horse business, still there is considerable demand for light horses of good quality that will sell, according to the quality and the speed they possess, for from \$250 to \$500 per head. Of course Standardbred horses, possessing enough speed to race well, sell for a good deal more money. Another feature that is playing a very important part in connection with light horses is the inauguration of the horse shows. We are holding horse shows in Vancouver and Victoria and New Westminster, and they have made wonderful growth in recent years. In fact, it has been stated by eastern judges that the horse show put up at Vancouver is second only, on this continent, to the show at Madison Square Gardens. These shows have provided a market for fancy high steppers, saddle horses and hunters.

From about the 30th of June to the end of the year, we obtain a large amount of our beef supply from the ranches of British Columbia, but during the balance of the year, we have to depend on Alberta for our supply of cattle. Many of our large

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ranches have been cut up and they are now producing the big red apple that is making British Columbia famous. At one time it was quite possible to produce beef cattle in the Fraser River district, but now we find the farmers giving up beef cattle and going into dairying, and they are selling their milk in the cities and obtaining very good prices. The average wholesale price for milk in British Columbia is from 20 cents to 21½ cents per gallon. This high price has had a very bad effect, many of the farmers having given up raising their heifer calves, with the result that good dairy females have become scarce and in some districts cannot be obtained at all. It is not an unusual thing for a man to receive \$150 for a first-class dairy cow. In fact, at a sale held south of Vancouver, dairy cows sold for as high as \$211 apiece and many sold for from \$150 to \$200, and eight yearling Holstein heifers sold at an average of \$141 per head, showing that there is a good demand for dairy animals. As far as the future is concerned, there is good promise of a large market in that country for dairy products.

Since the 1st of January, we have received opposition from a quarter we did not expect. Owing to the quiet times in Washington State, some of the condenseries immediately south of the line have found difficulty in disposing of their milk, with the result that they have closed down and they are now flooding the city of Vancouver with American milk. It is being sold at a figure much lower than the price the Fraser Valley farmer has received, and I am afraid it will have a disastrous effect on the dairy industry in that particular region.

It is very pleasant to know that the breeders of pure-bred dairy cattle are taking a very great interest in the Record of Performance in British Columbia, and I do not know of anything brought forward by either the Dominion government or the Provincial government that will have better results than the introduction of this Canadian Record of Performance. It places in the hands of the purchaser a means of finding out exactly what an animal can do, and he is not compelled to take the nice smooth story he had to take five or ten years ago. We have a British Columbia Dairymen's Association, and this year the two-year-old Ayrshire heifer owned by Mr. Joseph Thompson made a record of 10,446 pounds of milk and 351 pounds of butter in the year. She was not kept under forced conditions and was only milked twice a day, and she won a cup donated by His Honour the Lieutenant Governor. It is always a good sign when you see officials in high places taking an active interest in agricultural matters.

Another record that was made was that by a Holstein cow owned by Mr. Stevens, that gave 2,104 pounds of milk and 84 pounds of butter in thirty days, and I think that is very nearly the Canadian record. When we take into consideration the rich delta land of the coast and on Vancouver island, where we have very little winter, it will be understood that it is quite possible for the animals to graze outside, the year round, if they are fed a little at night. The grass grows twelve months in the year. Under these conditions, I expect that British Columbia will yet be producing some of the best dairy cows in Canada.

I regret to say that the sheep industry has not made very great progress. We are still importing a large amount of mutton from the United States, Australia and New Zealand. I think this situation is largely due to the low price of wool and in some cases to the ravages of panthers, wolves, prairie coyotes and dogs. While the mutton sheep are not increasing, the breeders of pure-bred sheep are keeping up the qualities of their flocks and holding their own. It is a deplorable fact that in a country like British Columbia, we should find it necessary to import thousands of sheep from the State of Washington, where they are produced under conditions almost identical with those on our side of the line.

The swine industry has about held its own, but we are still importing large numbers of live hogs from Montana and also an immense amount of bacon and hams. Hogs can be produced very profitably in British Columbia, and I think more attention

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will be paid to hog raising in the future. We prefer a medium length hog, and good Tamworths, Yorkshires or Berkshires will sell at from \$20 to \$40.

During the year 1910, some forty-three agricultural exhibitions were held. The government assisted these exhibitions by a grant of \$78,500, and in 1912 they will give \$100,000.

We have a British Columbia Fairs Association which meets once a year, and this year they took up the question of standardization of prize lists so as to make them as nearly uniform as possible. Another matter dealt with was a resolution passed requesting all the larger exhibitors to produce certificates showing freedom from hereditary unsoundness of all stallions placed on exhibition, and I think we will move along these lines still further in the near future.

We are threatened with the problem of conserving the fertility of the soil. These lands of the west, if carefully farmed, will prove one of the greatest assets that Canada has, not only for this generation but for the generations to come. Our agricultural colleges, the press, the farmers' institutes and the Department of Agriculture are doing splendid work in trying to educate the farmer to intelligently take care of his land, and animal husbandry is receiving the greatest encouragement. Many men who are able to keep live stock are still following the system of cropping one particular kind of grain, and we must try to demonstrate to them at our experimental farm, by carefully kept accounts, that they can make more profit by changing their system and keeping some live stock. I think we might consider the advisability of appointing a commission to look into this matter and to find ways and means whereby the present condition could be improved. We might consider the desirability of adopting some measure of adjusting our taxes so that a man would have a slight rebate in his taxes in proportion to the number of animals he maintained on his farm. The man who builds up and improves his land is not only providing for this generation but for the generations to come.

I have taken up all the time allotted to me, but before sitting down, I wish to thank you and your directors for having honoured me with a place on your programme, and I wish to thank the audience for the very kind hearing they have given me.

INTERPROVINCIAL TRADE IN PURE-BRED LIVE STOCK.

Andrew Graham, Pomeroy, Manitoba.

The basal structure on which to build an interprovincial or any other kind of successful trade in pure-bred stock is, and always will be, dependent on favourable trade conditions for commercial stock. In fact these two phases of the live stock industry are so intimately related that neither can continue a successful existence independent of the other. This statement is made on the supposition of the existence of normal conditions. Under abnormal conditions, such as a brisk foreign demand for the best of our pure-bred stock, success might come for a time to the breeder of pure-bred stock, while the home trade in commercial stock languished; but this would only be an evasion of the rule, and the more enterprising foreigner would reap the reward that under conditions properly adjusted would have been gathered in by our commercial live stock interests.

While it is true that the success of the pure-bred live stock business depends upon a healthy condition of the commercial stock business, it is quite as true that, if we are to hold our own market and share in the markets of the world, it can only be by the liberal infusion of the very best blood available into our flocks, studs and herds.

Mr. Monroe, of Montreal, speaking at our last convention, from the exporters' view point, made it very clear that we were being completely routed from the British market by the Argentine product. That product, he said, was the equal of the very

best Ontario fed product. The reason assigned was that for years past the Argentine breeders had been purchasing, regardless of cost, the very best blood available in England and Scotland for the improvement of their flocks and herds and now they are reaping their reward.

John Bull has a very sensitive and well-trained palate, and he is very critical when it comes to a matter of roasts and steak, and moreover he is in a position to secure just what suits him best. If this morning's breakfast of Canadian bacon and eggs is not exactly to his liking, to-morrow morning he will turn to Denmark for his breakfast. If his porterhouse steak to-day, from the back of an American black Angus does not quite suit his taste, to-morrow he may sample Argentina Shorthorn or a Scotch Highlander; the only way to get his chink is to put up the goods.

This association accomplished a great work when it brought to a successful issue the work of nationalizing our records. Our standards are becoming the basis of standards in older lands.

The Scotch Clydesdale breeders protested strongly against our conditions, but now they frankly admit that meeting our regulations has sharpened up their breeders and greatly helped their records. We may well be proud of our system of one record for each breed. Sometimes we become a little impatient with what we consider the very exacting detailed requisites, in securing certificates of registration, but it is quite possible that in spite of the greatest vigilance on the part of the record officials, fraudulent entries will occasionally be secured. If there is any one line of business that, more than all others, requires uprightness and integrity in those engaged in it, that business is the breeding and handling of pure-bred stock. It is a business in which the honest man and the trade, as a whole, suffers irreparable loss from the few overgreedy and dishonest men in the business. Twenty-five years ago the Clydesdale was as popular in United States as the Percheron, but through the operations of a few unprincipled dealers and the bringing in of a lot of inferior stuff, the United States market was practically lost to the Clydesdale breed.

After untold loss and years of careful operations the prospects seem good for the Clydesdale coming to his own again in that country. The British Columbia market has been practically closed to the producers of pure-bred stock farther east, through misrepresentations made by parties shipping to that province. In fact, there is stock all through that country that is no credit to the breeds they are supposed to represent. This has resulted in great loss to eastern Canada, and made it easier for the breeders in Washington, Oregon, Idaho and California to do business with British Columbia.

At the last meeting of our association, Dr. S. F. Tolmie and Mr. Logan gave a large number of instances where local men had been shamefully victimized and their confidence betrayed to the great loss of the trade in general. Some eight or ten years ago eastern breeders had a good trade with the United States for the best of their cattle and sheep. At that time the western breeder was scarcely able to compete successfully with the American buyer. The result was that a lot of second-rate stuff found its way west.

This seemed rather unfortunate but unavoidable. A very serious aspect of the affair was that many animals, failing to pass the required tuberculin test for the American market, found their way west with results, in some cases, extremely disastrous, the details of which will never be written. I have dwelt at far greater length than I intended on this phase of the subject, but the loss resulting to the business in general through the crooked transactions of a few would be hard to overestimate. I consider it to be the duty of those entrusted with the keeping of our records, and the duty as well of every breeder of pure-bred stock, to have our records and every pedigree in those records exactly what it purports to be.

I have found it simply impossible to get any figures to enable me to even approximate the amount of business done between the several provinces. There was a time

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when Ontario was almost the only source of supply for those in search of pure-bred stock. This does not apply altogether to dairy cattle, for Quebec has long been noted for her splendid dairy herds. Of late years splendid studs, herds and flocks have been well established in every province of the Dominion. These, naturally enough, have become distributing centres for their own community, and while interprovincial trade may not have flourished as in earlier years, still the amount of business has doubtless increased to a considerable extent.

The horse trade of Canada is in a very flourishing condition and promises to continue so, as long as the multitude from the eastern world continues pouring in to our western provinces. Canada, especially western Canada, has made wonderful strides in the last few years in the improvement of the quality of her horses, but I think I would be quite safe in saying that the value of the horse produce of almost any farming district in Canada could be doubled in a very few years by the judicious selection and use of sires best adapted to supply the demands of their particular market.

There is a heavy movement of commercial horses from east to west, but the interprovincial trade in pure-bred horses is not very brisk. Western breeders and dealers have struck the trail to the fountain head from which large drafts are being made of the best procurable in the old land. A few years ago there appeared to be some doubts as to western Canada's fitness to produce the best kind of draft horse, but all fears along that line have forever vanished, and we are satisfied that with the same opportunities for selection in breeding we can produce as good a draft horse as can be produced in the world. If eastern Canada would continue to do a good business with western Canada in pure-bred horses their offering will require to be of a very high order of merit.

The interprovincial trade in pure-bred cattle seems to have waned somewhat, especially in beef breeds, which may be partly attributable to the establishment of good herds in the several provinces, but let trade in commercial cattle get into a prosperous condition and the demands on eastern herds will once more assume large proportions.

Eastern sheep breeders are likely to have a brisk trade with western Canada. With the passing of the coyote and the advent of a better style of fence, sheep seem likely to come into great favour in the west; not only for their wool and mutton produce but also for the purpose of eradicating weeds. First-class rams as flock headers should be in great demand. These will have to be ordered by mail, and the man who is prepared to furnish a first-class article and hand out a square deal will be the man who will get the business.

Up till the last two years there has been lively business from east to west in pure-bred hogs. The establishment of good western herds is partly responsible for the falling off, but the unsatisfactory condition of the pork trade is the main cause. Excessive express rates make it very discouraging for western Canada to do business with Ontario in hogs, sheep or poultry. If these rates could be cut in two, a great revival of business in these lines of stock would result.

The freight rates in car lots and less than car lots on pure-bred stock are quite reasonable, but the express rates on the smaller stuff is simply prohibitive; the result of this is a great loss to the live stock interests of the country.

Any action by this convention that would result in a material reduction in express rates would greatly increase interprovincial trade. More rapid transit with better connection is absolutely essential in the handling of pure-bred stock by freight, especially on long hauls, both from a humanitarian and money view-point.

In conclusion let me say that the receipts of our farmers might be increased to the extent of hundreds of thousands of dollars annually by the careful selection and persistent use of the very best sires available. The gospel of improved stock cannot be preached too earnestly. Not a province in the Dominion but would benefit

immensely by an active campaign of education setting forth the great benefits to be obtained by the improvement of our studs, flocks and herds. We have not half good enough pure-bred stock in the country and we have far too many scrub purebreds. The truthfulness of the first statement will be admitted by every one and the truthfulness of the latter statement will be apparent to any one who has spent some time among the pure-bred herds of the country. A liberal application of the knife and the relegating of quite a percentage of the female to the grade ranks would be for the ultimate good of the industry. If our breeders, one and all, would be satisfied only, with a high standard of excellence, the superiority of good breeding would soon become so apparent that the services of the pure-bred live stock evangelist could soon be dispensed with. Adjust conditions so as to get the basis of the business, the commercial live stock industry, in as flourishing a state as the laws of supply and demand will allow and the interprovincial trade will take care of itself. Let me emphasize once more that if the breeders of eastern Canada are to hold the custom of western Canada in pure-bred stock, they will require to get a very noticeable move on.

THE PRESENT CONDITION OF THE LIVE STOCK INDUSTRY IN MANITOBA.

Miss E. Cora Hind, Agricultural Editor, Winnipeg 'Free Press,' Winnipeg, Manitoba.

I wish to thank you for the honour done me in asking me to speak on this subject; and if my paper seems in any measure to overlap that of previous speakers, I trust that you will bear with me.

The conditions of the live stock industry in Manitoba to some extent include the whole west, as, up to the present time, Winnipeg has been the largest sorting and distributing market, and the point at which all stock intended for export has been concentrated. To a very large extent Winnipeg has made live stock prices for the entire west.

The cattle industry in the west is passing through a transition period. As has been more than once stated, the day of the large ranch is nearly a thing of the past. There are still a few ranches in Alberta that are running from 25,000 to 30,000 head, and though these seem large numbers, they are relatively small compared with the number which the same ranches carried, even three years ago. I note that the *Statistical Monthly* places the cattle of Alberta, other than milch cows, at 956,000; but, in conference with some of the largest ranchers, within the last month, I am assured that their own rounding up of the cattle leads them to believe that there are not more than 600,000 or 700,000 head at the most. The calf crop of 1910 was small, and the calf crop of 1911 was also light, owing to the heavy shipments of young heifers during the latter part of 1910, when there was a keen market in the east for feeders and stockers. The west, paradoxical as it may seem, is to-day actually short of cattle in the range country; so much so indeed that more than one ranch is considering the advisability of bringing in Mexican cows, which was done some years ago, and the cows being crossed with high-class, pure-bred bulls, in time gave excellent results. The ranch cattle were the source from which export shipments were drawn. The export of western Canada has declined for the past three years, steadily. The maximum was reached in 1908, when 90,000 head were shipped to Great Britain; in 1909 the number dropped to 72,000; in 1910, to 48,500; in 1911, to 10,300. It is fairly safe to assume that, while there will probably be an increase in export shipment from time to time over that of 1911, the export trade will never again reach the proportion which it has done in the past. Every evidence goes to show that it is impossible for Canadian cattle on the hoof to compete successfully with Argentina chilled beef in the British market. There are probably many men present who are more fully advised

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on the details of this competition that I am, but I am informed by several western exporters that the outlook in Britain is so discouraging that, for a time at least, they will withdraw their agencies from the old country.

THE HOME MARKET.

The fact that our export trade is diminishing is, however, no reason why the west should not increase its number of cattle. The cattle of the future will be largely raised on grain or possibly smaller stock farms, and it will take many years of breeding this way to overstock the home market, or supply the need for feeding stock, which is on the increase in Ontario. In addition to this, the province of Alberta particularly has a steadily growing market in British Columbia and the Yukon. During the year 1911 almost 25,000 head of cattle were shipped from Alberta to British Columbia and the Yukon. Thousands of head of these cattle came off the Canadian Pacific railway, Calgary and Edmonton section, where mixed farming is carried on to perhaps a greater extent than in any other portion of Alberta or Saskatchewan. The Winnipeg market for butcher cattle has consumed, in the past five years on an average, about 65,000 head, and during the past year over half a million pounds of dressed beef had to be brought in from Ontario to meet the demands of the market. The whole domestic market of the west, which has for its centres Winnipeg, Regina and Calgary, is a constantly growing one, and has never yet been adequately supplied with finished cattle or with choice, well fed veal. In 1910, the Canadian west supplied to eastern Canada, mainly Ontario, 32,000 head of feeders and 40,000 head of butcher cattle. In 1911, the shipments of feeders to the east dropped to 5,400; and butcher cattle to 16,875. This was not occasioned by a lack of demand from the east, but by the actual lack of cattle, particularly butcher cattle suitable to the requirements of the eastern market. The lack of finish to western butchers' cattle is indicated by the fact that, while the average weight of the cattle for the year was considerably in excess of that of 1910, the dressing-out weight showed an improvement of only $\frac{3}{4}$ -pound. While the average price of butchers' cattle at Winnipeg for 1911 was \$4.96 $\frac{1}{2}$ per cwt., the price in March, April and June, when the winter-fed stock is principally marketed, ran as high as \$5.91—the highest price in butchers' cattle in five years. The advance in the average price for the year has been from \$3.91 $\frac{1}{2}$ in 1907 to \$4.96 $\frac{1}{2}$ in 1911. And while the average dressing-out weight for the whole five years was only 55 $\frac{1}{4}$ per cent, the dressing-out weight of the winter-fed stock was 58 $\frac{1}{4}$ per cent.

These things all go to show that there is an ample and growing market for all the cattle which the west can raise. That there is no difficulty in winter feeding in Manitoba, even in the open, has been demonstrated over and over again. Men such as Mr. George Hamilton, of Neepawa, Mr. Lawrence and Mr. Cook, of Newdale, have been feeding bunches of steers either in open sheds or in bluffs, for years; and their stock invariably commands the top of the market and something more. Last week Mr. George Hamilton put on the market at Winnipeg a bunch of steers of some 60 head, which he had fed as indicated in the following paragraphs.

These steers had been selected by Mr. Hamilton, in September last, and run on good pasture until October 25, when they were started on feed. They weighed on an average 950 pounds. There were nine yearlings in the bunch; the balance were two year olds. They were fed in rough shed of ship lap, the south side of the shed being open. The ration was bran, barley chop, oat sheaves, and wheat straw, as much water as they wished to drink and all the salt they wanted.

They were started at 2 pounds of bran and 6 pounds of barley chop and gradually increased until, at the time of sale, they were getting 12 pounds of meal and bran a day. They had two oat sheaves a day, one in the morning and one at noon, and at night all the straw they wanted to eat, and were always well bedded.

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The cost of the steers was \$4.15 per cwt., or	\$2,365 50
Interest on this money for the period	47 00
Total cost of feed and wages of help amounted to \$16 per head	960 00
	<hr/>
	\$3,362 50
Weighed out on February 9 at 63.425, and sold at \$6.50 per cwt., or a total	\$4,447 62
The gain was a little over 190 pounds per steer, and the gain in price \$2.35 per pound, allowing for freight, a profit remains of \$17 per head.	

It has now been fully demonstrated that alfalfa can be grown with ease in all of the three prairie provinces, and that it is perfectly safe to reckon on two cuttings a year, with an average of three tons to the acre. Manitoba, last year, produced nearly 9,000 acres of fodder corn, with an average of between 7 and 8 tons to the acre of dry fodder. And, owing to the coolness, it was not an especially favourable year. Manitoba went further, however, in corn production, and I have with me to-day a bunch of ears of corn, matured in perhaps one of the most unfavourable seasons for corn production that it would have been possible to conceive. The *Manitoba Free Press* has taken a great interest in this matter of corn, and, a few years ago, secured a quantity of seed of what is known as Patterson corn, and distributed it. The only thing that they asked of the people growing it was to send them in six ears of corn and an account of the date at which they planted it, and at which it was matured. I have in my office at Winnipeg about fifty samples of corn sent in. The ears here to-day are an average of those samples. As nearly as possible the yield has been from 20 to 25 bushels to the acre, and you can see for yourselves the quality of the corn.

Oat sheaves, which are regarded by western feeders as worth quite as much as timothy for feeding stock, and even better for milch cows, can be raised with the greatest ease, and yield from three to four tons to the acre. Of course, the abundance of coarse grains and small wheat for making into meal is too well authenticated to require more than passing mention. The west, however, has been doing well in root growing, and has enormously increased its acreage in roots during the past year, though the acreage for the three provinces at present is a little under 30,000 acres. Yet even on this small area the crop produced was valued at very nearly \$3,000,000.

So much for the possibilities of growing feed for finishing our butchers' cattle. Without wishing to touch on any matter which might have a political significance, I would like to mention that, when I was in Chicago in December of 1910—a period when the discussion of reciprocity was active—I had the opportunity of meeting with a number of the largest feeders for the Chicago market. They were particularly keen on getting Canadian steers, and I asked them why they preferred them to those of the Western States—Montana, Nebraska and Texas. They agreed in stating that the steer from the Canadian west was so healthy, so large, and responded so readily to feeding, that he was the most profitable steer they could handle. If our steers are the most profitable our American cousins can procure for finishing purposes, they should be equally profitable for us.

HOGS.

The total receipts of hogs on the Winnipeg market for the year 1911 was 85,000. In 1905 the receipts were 145,000; in 1909, 128,000; in 1910, 91,000—showing that there has been a steady decline in the number of hogs being raised. Of the 85,000 sold in 1911, 5,276 came from eastern Canada. Winnipeg has a total packing capacity of 450,000 hogs yearly, or a total daily packing capacity of 1,500; and an average of 266 hogs only were received. Out of these there had to be taken a certain percentage

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for fresh pork. That our packing capacity is by no means too large for the requirements of the trade is indicated by the fact that during the year there were imported into Winnipeg for distribution in that city and western points 6,074,157 pounds of hams and bacon; 1,098,507 pounds of lard; and over 500,000 pounds of dressed pork, fresh. Of the hams and bacon a little over 2,000,000 pounds came from Ontario, and the balance came from the United States, and paid duty. There was also a large percentage of the lard brought in from the United States. As there are various grades of ham and bacon, it has been impossible to work out the exact value, but I am informed by the dealers that 15 cents would be a very conservative estimate of the price of this meat brought in; and the lard, 9 cents per pound. This would give an outlay for bacon, hams and lard, which certainly might have been produced in the west, of \$1,009,989.

The average price of hogs on foot in Winnipeg for the past five years has been excellent. In 1907, it was \$6.79; in 1908, \$5.69; in 1909, \$7.33; in 1910, \$9.07; in 1911, \$7.71. The Canadian west has enjoyed excellent health for its hogs; and there is no difficulty in raising barley, which is the best staple for hog feeding, though a mixture of all coarse grains is perhaps cheaper and more satisfactory. Alfalfa will also play a part in the hog-raising of the future. With these figures it is hardly necessary to remark that there is small danger of over production of hogs in the Canadian west for many years.

That western farmers are willing to raise hogs, if it can be done without too great an expenditure of time and money, there is good evidence. During the past autumn I published in the *Free Press* a description of the hog mills which are in use to some extent on the American side, and by which the hog grinds his own food. In a comparatively short time I had fully seventy-five inquiries as to where these mills could be obtained.

SHEEP.

There were sold on the Winnipeg market during 1911, 43,614 sheep; and of these over 17,000 came in from South St. Paul and Montana. The Canadian west, at three of its ports of entry—Emerson, Gretna, and Morse, Alberta, received altogether 33,498 American sheep for slaughter during 1911. In addition to the sheep brought in on the hoof, there was just about a million pounds of dressed mutton received from Prince Edward Island, Ontario, and considerable from the United States. As the average weight of the sheep for the year was 96 pounds, this would mean an additional 1,000 sheep, making the receipts of sheep from eastern Canada and the United States for our market 34,500 head.

There has been much said in the past of the difficulty of raising sheep, owing to the attacks of wolves; but this is no longer an excuse for not raising them. A corral that will hold a flock of from one to two hundred can readily be constructed of Page wire fencing, two widths of fencing with the top width turned outward. This absolutely precludes the possibility of wolves getting in; and there are a number of wheat farmers, both in Manitoba and Saskatchewan, who are now running flocks of from 100 to 300 on their farms, letting them eat down the summer fallow in the early summer, before it is ploughed, and turning them on the stubble as soon as the first grain is cut. In the intervals they usually have them herded—a matter of small cost where a lad in his 'teens or an old man can easily look after them, if he has a pony. There is in Winnipeg a specially active and growing market for lambs for the Christmas trade; and Mr. Thomas Forks, of Pipestone, and Mr. H. L. Emert, of Oak Bluff, Manitoba, for Christmas, 1911, brought in bunches of lambs, practically right off the stubble, which averaged 85 pounds apiece, and sold for \$6 each. Both of these men declared themselves satisfied with the profit. The average price of a sheep on the hoof at Winnipeg for 1911 was just about \$5, so that the 34,500 head brought in from outside points represents \$165,440 which should have gone into the pockets of the Manitoba farmers.

HORSES.

The horse bill for the Canadian west for 1911 through Winnipeg was a little over \$7,000,000, and the bulk of this money went to Ontario, though there was between four and five thousand head of hack horses brought in from the United States. These figures, of course, take no account of horses brought in with settlers' effects. Though this bill looks enormous, it is an improvement on that of 1910, when the west spent over \$10,000,000 for horses. There has been a good deal of conjecture that the decline in the number of horses from 33,000 head in 1910 to 26,000 head in 1911 was due to the increased number of agricultural tractors used, the horse-power of the agricultural tractors sold being roughly 10,000. While there is no doubt that the sale of agricultural tractors has meant their replacing horses on some farms, the difference between the numbers of 1910 and 1911 is not wholly accounted for in that way. The difference was considerably made up by the number of western horses for sale. 1911 brought on the market practically the first large crop of heavy horses which the west has produced. Manitoba shipped many hundreds of head west to Saskatchewan and Alberta, the district of Brandon alone accounting for 1,200 horses. There are now a sufficient number of horses for sale in southern Saskatchewan to warrant a series of co-operative horse sales, the first of which was held during the last week of January, when geldings and mares, sold individually, ran from \$225 to \$300 each, and teams from \$450 to \$550. It is estimated that the increased size of farms has raised the average of the number of horses carried by the individual farmer within the past five years from 4 to 8. Of the 357,000,000 acres of arable land in the Canadian west, up to the present time less than 30,000,000 acres have been brought under cultivation, so that there is small danger of the horse market being overstocked for many years to come. Some idea of the profit in raising horses may be gathered from these figures, furnished to me by one of the horse ranches, and that by no means one of the largest. Six years ago this company took an inventory of their horses, and made up the value to \$45,000. To-day their books show that the natural increase of these horses has brought the value of their present stock on the ranch up to \$75,000. The number of pure-bred stallions of heavy breeds is now roughly 1,000 for the three provinces, and nearly one-half of these are in Manitoba, which is at present our largest horse-breeding province, though Saskatchewan is running a very close second.

The foregoing is roughly an outline of the present conditions of the live stock industry in Manitoba, and, to some extent, the whole west. The figures show that we have paid out a very large amount of money, namely, over \$8,000,000 for foodstuffs and horse-power, that it would seem to many we might have produced ourselves. It is rather a fad of those who are enthusiasts in live stock raising, to berate soundly the western farmers for not having gone more fully into stock-raising; and on this subject the western farmer is very much in the position of the woman with the large family, who, being left a widow, was asked by her rector if she had received any advice as to what she should do for the future, and who replied tartly that she had had so much advice that, if it had been greens, she could have stocked a shop. There is no doubt that the west has not raised as much stock as it should have done, but the critics should bear in mind that, like all new countries that are easily accessible for agriculture, the west has received a very large number of immigrants who have never farmed in their lives before. The richness of the soil has enabled these people, with very indifferent farming, to raise crops, frequently, enormously profitable crops; but they have no knowledge of stock-raising, and some of those who have gone into it failed on that account. Again it is natural in any new country to follow the line of least resistance. It has been easier to grow wheat than to raise stock, and sometimes it is easier to grow flax than wheat. During the year 1911, one farmer in Saskatchewan was able to ship from his own station 85,000 bushels of flax for which he received at that station \$2 per bushel. This was a first crop on land broken and disked during the August and September of 1910. The flax gave the enormous average yield of 26

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bushels to the acre, and when all due allowances had been made for the cost of the land, cultivation, harvesting, &c., he had a clear profit of over \$1 per bushel. Perhaps one of the most difficult things to fight in the matter of live stock production, is the example of the men who have sufficient capital to farm in a very large way. The smaller man sees what they are able to do, and he is naturally attracted to the spectacular side of farming, and the big man is too often fond of jollying the smaller farmer for want of enterprise. Western farmers are not fools, though in common with the rest of the world, they occasionally do foolish things. I am not sure but that their eastern brethren who now so frequently sit in judgment upon them would do precisely what they have done in the same circumstances. Speaking personally, I am perfectly sure, that I would be strongly tempted to do it myself.

The western farmers, are, however, awakening to the need of stock, and slowly, perhaps, but surely, they are going into stock-raising. In the past it is quite true that it frequently paid them better to sell coarse grain than to feed it—that is, the immediate money return was larger. Now, however, they are beginning to realize that a return to the soil of some of its fertility is necessary; and thus it is wiser to feed the coarse grain to cattle, sheep and swine, and ship beef, than it is to sell the coarse grain direct. There is a practically unlimited market for all kinds of live stock in the west. There is no limit to the quality and quantity of feed that can be produced. Our immigrants from Europe, particularly the Galicians and the Icelanders and Swedes, are proving themselves admirable stockmen. Every year on the Winnipeg stock yards we see more and more of these people coming in with mixed carloads. Everything possible should be done to encourage the breeding, feeding and finishing of cattle, sheep and swine, and perhaps no organization has a better opportunity of doing this than the live stock associations. But whatever agency is employed to bring this matter to the attention of the western farmer, it must always be borne in mind that in any country where a man can raise either wheat or flax as easily as in the prairie provinces, and while there is still so much new land to be occupied, the raising of live stock will of necessity have to be encouraged by every possible means, in order to induce men to go into it.

Col. McCRAE.—I beg to move that the special thanks of this convention be given to Miss Hind for the very excellent paper we have just heard, the best I have ever heard before a convention.

Mr. S. SMITH, Dewdney, B.C.—I have very much pleasure in seconding that motion.

The CHAIRMAN.—It has duly been moved and seconded that we record a hearty vote of thanks to Miss Cora Hind for the paper she has given us at this time. (Carried with applause.)

I desire to convey to you, Miss Hind, the sense of this meeting. We think you have shown very good wisdom in coming here to address us at this time.

Miss HIND.—I am very much obliged for the exceedingly kind way in which you have received me. I feel not altogether a stranger among you.

Mr. A. B. POTTER, Longbank, Man.—The subject of interprovincial trade was brought up, and I think we should consider the express rates on small animals. We had an experience last summer in sending out a few animals and the express rates were \$20.05. This is a live question in the west, both freight rates and express rates, and I hope the Railway Commission will deal with that. To my mind it is one of the most important things with regard to interprovincial trade.

Col. McCRAE.—I think this gentleman ought to patronize the association cars rather than the express companies. If we want to do anything, it is to get better terms for our association cars. We arrange to have them sent out at certain definite

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times and the breeders should patronize these cars. The companies have increased the rates by charging half rates for the men coming back and something ought to be done to endeavour to get that taken off. You can get better accommodation in the association cars than you can from the express companies.

PRESENT CONDITIONS OF THE LIVE STOCK INDUSTRY IN ALBERTA.

W. F. Stevens, Live Stock Commissioner, Edmonton, Alberta.

As the conditions affecting live stock in Alberta are different for each class, I shall deal with them separately, following the usual order of horses, cattle, sheep and swine.

HORSES.

During the past twenty years there has been a complete revolution in the horse industry of Alberta. A score of years ago, Alberta had horses to burn. Everything was favourable to production, but for the want of a profitable market, the business languished. The first event worth noting in the chain of circumstances which revolutionized the business, was the rush for the Yukon. This created a demand for a large number of pack horses, which at that time were obtainable for \$5 each or \$50 a dozen. It stimulated also the trade in saddle horses and animals suitable for freighting and cartage purposes.

Many of the adventurers who started for the gold fields were unable to endure the hardships of the far north, and turned back. On their journey southward they took time to note the agricultural possibilities of the country through which they were passing and a considerable number decided to remain and engage in farming, and in so doing, they created a demand for horses suitable for agricultural work. Co-incident with these events there began the tide of immigration from Europe, the eastern provinces and the United States which, by the close of the last century, had more than doubled the value of farm horses. Then followed the Boer war, which stripped the country of its surplus animals suitable for saddle purposes. With each new demand prices rose and the horse ranchers of Alberta looked into the future with a feeling of confidence they had not known for years. Their ranges were still intact, the ever increasing tide of immigration to the north assured a permanent market and their chief concern was how to derive the greatest possible benefit from it.

Their good fortune was, however, destined to be short lived, for almost co-incident with the close of the Boer war, it became known that winter wheat could be successfully grown in the southern portion of the province. This event sounded the death knell of horse-raising in Alberta as a ranching proposition on a large scale.

As early as 1905, females began coming to market in large numbers, showing that many ranchers were either tempted by the fancy prices offering or were forced by the rapidly increasing mileage of barbed wire fences, to sacrifice their breeding stock. Then immature animals and even foals began to be in evidence. Every such shipment proclaimed the fact that pastures were being converted into grain fields.

Although the records of shipments showed more animals going to market each year over the preceding one, the fact that so large a percentage were females and immature animals was a sufficient warning that the time must come when there would be an abrupt falling off in Alberta shipments and importations would begin. The records of shipments since 1905 are as follows:—

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1905.....	9,310	head.
1906.....	13,302	"
1907.....	11,924	"
1908.....	14,419	"
1909.....	22,752	"
1910.....	27,887	"
First ten months of 1911.....	13,113	"

The total for the year 1911 may safely be reckoned at 16,000 head, or nearly 12,000 head less than was shipped the year before.

Railway construction and municipal improvement, which in 1905 began to assume large proportions and have steadily increased since then, drew heavily on our stock of draft horses, and by 1908 it became evident that the local supply of this class would soon be exhausted and that prices would mount to higher levels than had yet been known. In self-protection, contractors began importing draft horses from Ontario and mules from the United States.

The importation of mules was especially large during 1909 and 1910, and while I have not the figures showing the exact number, they may be fairly estimated to be about 2,500 teams. There are many evidences that large importations of draft animals will continue for many years. The farmers of the older settled districts in Central Alberta are beginning to have horses to sell, but the number is far below the demand. Prices are on an importing basis and are consequently high. A team of 1,300 pound horses, sound in wind and limb finds ready sale at \$600, and I have known instances in which \$650 has been paid, and heavier animals command a premium of from \$30 to \$50 for every one hundred pounds in excess of this weight.

Importations are no longer confined to draft horses, but eleven and twelve hundred pound animals are now being brought in. To my own knowledge, there are at the present time, several Alberta buyers in the States of Montana, Idaho and Washington looking for horses suitable for farm work.

This condition is placing a heavy charge on our agricultural development and is greatly retarding it. It accounts for the enormous increase in the number of tractors now in use on the prairie and it compels men of limited means in the bush country to use oxen or quit. Naturally, this condition will in time right itself; the question at the present, is by what means can this process be hastened.

A great deal of educational work has been, and is being done, by the Provincial Department of Agriculture, through its institute meetings and short-course schools, to induce farmers to raise more and better horses. Our farmers are to-day better judges of horses than they were five years ago, and are more exacting in their demands of what a stallion must be that they will consent to breed to. The results are noticeable in the improved class of foals being exhibited at our country fairs, but with the settler on the frontier it is still largely a matter of 'Hobson's choice.'

Considered from the standpoint of climate, water, feed and markets, there is every inducement for the farmers of Alberta to embark more largely in the growing of work horses and of mules. For those who understand it, the former may be made as profitable in Alberta as they now are in Ontario and Manitoba, and the latter as remunerative as they ever were in Kentucky or Missouri. These are the facts that the superintendent of fairs and institutes is trying to impress upon our farmers.

But we have a class who do not need this fact to be brought home to them in order to induce them to embark in the business. They are the man of the past generation who, like Othello, find their occupation gone. They are too young to quit and too old to learn a new trade. They are the ranchers whose ranches have been homesteaded and put under fence. The question is, to what extent would encouragement to this class promote the general welfare? There are in Alberta, in the north as well as the south, small areas of doubtful value as farm lands. My idea is to grant closed leases of these lands in tracts not exceeding ten sections to any one individual, for

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a term of years sufficiently long to induce him to stock it, and provide such buildings, fences and watering places as will enable him to live in comfort and conduct his business economically, and at the expiration of his lease, permit him to purchase, not to exceed two sections of his lease-hold, at a price stipulated in his lease. I know, personally, of townships which would be much better off if they were occupied by four or five prosperous ranchers than they now are with a dozen or twenty homesteaders struggling against starvation, and the province as a whole would be benefited if settlers were directed to lands well suited to agriculture, of which there are still hundreds of thousands of acres available, and these rough, sandy and stony areas devoted to grazing purposes.

CATTLE.

In the raising of beef cattle, Alberta is now rapidly approaching that low ebb in production which, so far as I can learn, has characterized every country that has changed from the ranching to the farming system. Even in the farming and dairying districts, those who were growing beef cattle ten years ago did so more after the methods of the rancher than after those of the farmer. They either had large tracts of land of their own not yet brought under cultivation, or there were unoccupied tracts adjoining their homesteads which provided them with pasturage at little cost in money or attention. The straw which would otherwise have been burned, was used as a substitute for the rancher's winter range, and the result was that a matured steer had practically no cash and but little labour charged up against him. But as these lands gradually came under cultivation, each man found that the pastures on which his animals were grazing had a cash rental value for grain growing, and it was then that he realized that he could not afford to raise steers and sell them at the prices which prevailed, while our markets were on an exporting basis. It was then that he went out of the business and turned his attention to other lines of agricultural effort.

That the process of reducing herds was gradually going on among the farmers of the north as well as the ranchers of the south could be easily seen from the number of females and calves which were each year being sacrificed in all parts of the province. Although the yearly returns showed no reduction in the number of animals going to market, as in the case of horses, the class of animals marketed told plainly that sooner or later the evil day must come. As in the case of horses that evil day came in 1911, during the first ten months of which only 46,074 head of cattle were reported by the provincial brand inspectors as against 184,229 for the year previous, and during the last half of May and the first half of June, fat cattle and dressed beef were actually imported from the east.

The sudden rise in prices incident to this condition, as well as the unsatisfactory returns from grain farming during the past two years, is causing our farmers to turn their attention again to beef production. Tempted by the higher price of cattle and discouraged with grain farming because of the high price of labour and of horses, many are seeding down their farms to the cultivated grasses. This fact is eloquently told by the returns from Alberta, which show that in 1911 there were 165,000 acres of land seeded down to hay and clover as against 65,000 for the year previous. I may add that during the past year I have received more requests from farmers for information regarding the cultivated grasses best suited for both hay and pasture, than I have received during any year since undertaking to perform the duties of Live Stock Commissioner for the province. These areas seeded down to grasses, taken individually, are usually small, but since 'Many littles make a muckle,' they are sure to be reflected in the live stock returns of the future.

Besides this, the higher prices prevailing during the past two years, on beef cattle and dairy products have made it possible to utilize districts for stock-raising in which the Indian, the moose and the deer, were, a few years ago, unmolested. Small ranches are being established wherever hay and pasture are obtainable, as far as seventy-

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five miles north of the Saskatchewan river, from the eastern boundary of the province to the foothills. The most serious drawback to the development of these small ranches, and I may say to the general improvement of the live stock industry in the north half of the province, is the fact that we haven't the kind of cattle especially suited to the country and to the needs of the people who are going there. When determining the class or breed of cattle a settler should buy, due consideration should be given to the use to which they are to be put, to the environment and general conditions under which they are to be kept, and to the skill of the person in whose hands they are to be put. Unfortunately, most people, when giving advice on this question, ignore the last two factors in the problem. They make the broad statement that if one is going in for beef he should have cattle of one of the special beef strains, and if he is going in for dairying he should have cattle of one of the special dairy breeds. But here we have a class of settlers who have not the means to wait for returns from beef cattle, yet they can raise a few steers at little greater cost than the hay necessary to feed them through the winter and they want steers that are worth feeding; they can't go in especially for milk, yet they have to milk enough cows to supply their daily wants and they ask for cows that are worth milking, and that kind of animal is practically non-existent in Alberta to-day. I knew them in Ontario when a boy, and in the Western States in later years, and they played an important part in the pioneering days of both countries, but the movement toward specializing in the older provinces has prevented their appearance in our newer ones.

An important fact that is too frequently overlooked is that the special dairy breeds give good returns only when in the hands of a special dairy man and in a special dairy environment; if these two be lacking, my observation has been that the returns fall below those of animals of less highly specialized breeding.

With increased attention on the part of our farmers to stock-raising and the utilizing, for grazing purposes, of areas hitherto unused, there is certain to result, within a few years, a marked increase in our output of beef cattle. How soon it will overtake consumption in Alberta, British Columbia and the Yukon I shall not undertake to predict, but this I do not hesitate to say, that it will not far exceed consumption in these three markets unless some method of exporting better than we now have, has been provided. It is impossible to raise two steers on the farms of Alberta for the price of one on the Smithfield market. A charge of \$30 per head for transportation, feed and attendance, a shrinkage amounting to \$10 and a loss in quality amounting to another \$10, in addition to a reasonable profit to the men who engage in the export business, are burdens that the industry will not stand and the farmers of Alberta will again quit raising beef cattle the moment they are subjected to them.

SHEEP.

The sheep industry of Alberta, as a ranching proposition, is, for the want of pasture, rapidly on the decline. The areas formerly set apart for sheep leases, though among the poorest of our grazing lands, are being invaded by the homesteader and the flock masters are looking about them for other ranges. They have little to hope for on the prairies and their eyes are now turned towards the foot-hills. They say if they were permitted to take their flocks into the unoccupied mountain valleys for the summer months, they could establish winter headquarters in the foot-hills and perpetuate their business indefinitely. In company with a representative of the Department of Agriculture at Ottawa and a committee appointed by the Southern Alberta Wool Growers' Association, I examined, during the summer of 1910, the mountain valleys, beginning at the International Boundary and continuing northward to township fifteen. We avoided all districts in which there were evidences of cattle and horses being kept, and still we found areas which were estimated by the committee of wool growers to be sufficient to pasture, from June to October, 50,000 head of sheep. Speaking personally, I have no hesitation in recommending that the requests of the

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wool growers be given favourable consideration by the Department of the Interior, and that a limited number of sheep be permitted to graze in these unoccupied valleys, preference being given to small holders who combine to make up a flock sufficiently large to justify the employing of a herd-man and where winter quarters are nearest the desired summer pasture.

As a farming proposition, interest in mutton production is on the increase. Even in the districts devoted to wheat growing, the farmers are beginning to realize that sheep can profitably be made to enter into their system of agriculture. They see that it is cheaper to let a flock of sheep attend to the business of packing the soil and killing weeds, than to do it with teams, especially while the wages of a four-horse outfit is from \$8 to \$10 per day.

The principal detriment to a rapid expansion in sheep-raising on the farms of Alberta is the cost of building suitable fences. If some means could be devised whereby farmers could secure coyote proof fencing at a moderate price sheep-raising in Alberta would at once enter more largely into the general husbandry of the province. Providing foundation stock and pure-bred rams at low cost, does not greatly interest the man who is conscious of his inability to protect and care for a flock after he has got them.

SWINE.

To outsiders, the swine industry of Alberta is something of an enigma. They say, 'how is it that a province that produces grain suitable for swine-feeding in such large quantities as does Alberta, fails to raise enough hogs to supply its own requirements.' As the difficulties causing this condition and the remedies therefor are entirely provincial, little need be said on the subject at a convention such as this.

To one who is familiar with conditions throughout the province, two reasons stand out prominently. One is the difficulty in inducing newcomers to adapt their methods to the climatic conditions of the country. Each prides himself on the fact that he was a successful swine grower in the country from which he came and he resents any intimation that the methods which brought him success there, can do otherwise in the northwest. Each follows his own ideas despite the repeated warnings of his more experienced neighbours until his losses have practically put him out of business. When that occurs, he is ready to take up with a new idea. Generally speaking, the American keeps his brood sows so fat during the winter months, that, although they have plenty of chance to take exercise, they do not do so, and when farrowing time comes, a large percentage of their pigs are born weak and soon die. The eastern Canadian, on the other hand, thinks he must close house his hogs, and, although his brood sows may not be too fat to farrow their pigs successfully, because he has denied them sufficient exercise, he also suffers a serious loss. In addition to this, the close housing of animals during cold weather causes frost to accumulate on the interior of the buildings in cold weather, and this is followed by dampness, when the weather moderates. Dampness and cold cause rheumatism and pneumonia and the swine grower who practises close housing suffers an additional loss from these causes. It is a difficult matter to convince a newcomer to the province that there is no better method of wintering brood sows in Alberta than feeding them once a day on whole oats thrown broadcast on the ground, giving them a warm thin slop every night and morning and allowing them to bed in a pile of wheat straw from which other stock are excluded.

The other outstanding fact connected with swine-raising in Alberta is that as soon as more hogs are grown than are required for fresh meat purposes, prices are put on an export basis, and this, in spite of the fact that most of our cured meats and lard are imported from the east and from Chicago. Good business may make this necessary but our farmers refuse to see it that way. A great deal has been said and written about the recent importation by Alberta packers of some 10,000 head of dressed hogs

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from Toronto at a price a fraction of a cent lower than locally dressed carcasses cost them. In defence of our farmers it is but fair to say that these eastern carcasses are mostly of classes that are subjected to a dockage of from $\frac{1}{2}$ cent to 1 cent per pound live weight in Alberta.

THIRD SESSION.

Mr. ANDREW GRAHAM in the chair.

The CHAIRMAN.—I have been asked to take the chair until the president arrives. You are all aware of the subject for discussion this evening. We are fortunate in having with us to-night the chairman of the commission that inquired very closely into the subject of tuberculosis. He is, undoubtedly, the highest authority on the American continent on this subject, and I am sure we will have a very able address from Dr. Rutherford and it will be followed by an interesting discussion.

I have much pleasure in calling on Dr. J. G. Rutherford to address the meeting.

ADDRESS:—BOVINE TUBERCULOSIS.

Dr. J. G. Rutherford, C.M.G., Veterinary Director General and Live Stock Commissioner, Department of Agriculture, Ottawa, Ont.

Mr. CHAIRMAN, LADIES AND GENTLEMEN,—I feel that I owe you an apology for coming doubly unprepared. I have been so exceedingly busy that I have not been able to prepare a paper, and besides that, I have been suffering from a very severe bronchial cold which has been keeping me awake at nights. For both of these serious defalcations on my part I must most humbly apologize.

The subject before us to-night, bovine tuberculosis, is one of very great interest to all live stock men, but more particularly to owners of cattle and hogs. Horses, while by no means immune to the disease, very seldom contract it, although I have seen, as most practising veterinarians have seen, isolated cases of tuberculosis in horses, generally following the practice of bringing up a colt on cow's milk.

Sheep are practically immune to tuberculosis. It is very seldom, indeed, that the disease is found in these animals, although there are a number of cases on record.

It is, as you know, a very serious and rapidly becoming more prevalent disease of poultry. The form of tuberculosis which affects poultry is known as avian tuberculosis, and it is not nearly so transmissible to animals of other species as is bovine tuberculosis.

You will recall that when in 1882 the late Professor Robert Koch made the great discovery of the bacillus tuberculosis, it was considered for a number of years that there was practically no difference between bovine tuberculosis and human tuberculosis. Strange to say, the very man who was responsible for that opinion, Dr. Robert Koch, himself, was the individual who, at the International Congress, held in London, England, in 1901, took the opposite ground and made the claim, for which he ever afterwards strongly contended, that the form of tuberculosis affecting cattle was essentially different from the form of tuberculosis affecting human beings, and that the danger of transmitting one form to animals of the other species was almost entirely negligible.

Personally, I never could see my way clear to adopt this view of Professor Koch, and while I fully realize and speak with all due recognition of my own limitations in

the field of science as compared with those of a man of the outstanding eminence of Dr. Robert Koch, I may say that I felt all along, as a practical veterinarian, that I had very good grounds for thinking differently from what he did.

There is no class of men to whom the world at large, at the present time, owes any more than it does to the bacteriologists. We must all admit that these patient, painstaking students of science, who have devoted their lives, in many cases, and in all cases, the most patient, careful and studious attention to the practical problems of disease, and its transmission are entitled to every possible credit and appreciation that we can give them. At the same time, and I speak again with all due deference, I am just a little chary of accepting their views on every occasion or on every subject. I have an old friend, a cynical Englishman, who edited for many years one of the leading veterinary periodicals published in London, England, and I remember that a number of years ago when discussing this same subject, he said, 'It is very well, while appreciating the work of the bacteriologist, to be careful in accepting his conclusions, and, it may be laid down as a safe rule, that it is not wise to accept the verdict of a bacteriologist unless it has been verified by another bacteriologist of eminence, and preferably one of another school and another country.' For instance, he said, 'I would like to have the findings of a German bacteriologist confirmed by a Frenchman, and I would like to have the findings of a Frenchman confirmed by a German, and I would prefer to have the findings of either of them confirmed by an Englishman. As for the findings which we receive from America, I would say, that, in all cases they should be received with respectful doubt.'

The practical man who keeps his eyes open and who drives in and out of farmers' yards and who walks in and out of farmers' stables, has perhaps as good opportunities of judging of the actual facts with regard to the transmissibility or non-transmissibility to the human species of bovine tuberculosis as has any learned gentleman, who, with one eye glued to the business end of a microscope keeps the other fixed on the star which he regards as his own scientific reputation. I saw, long before Dr. Robert Koch made his first pronouncement in 1882, many, many things, which led me, then a very young, although enterprising veterinarian, to believe that bovine tuberculosis—tuberculosis of cattle—was directly transmissible to human beings. I saw that where the dairy herd on a farm was badly affected with tuberculosis, the chances were very strongly in favour of the family on that farm, particularly if such a family was composed of young people, being also very badly affected with tuberculosis. I had a good deal of experience when I was a young man with bovine tuberculosis. Among other experiences I lived for a time on a farm which many of you know, the 'Bow Park farm,' which was a great distributing centre for the fashionable Shorthorn cattle of thirty or forty years ago. It was also a distributing centre for the whole of western Ontario of bovine tuberculosis. It spread that disease all over the western peninsula, and it sent it to many other parts of the continent where the cattle from Bow Park farm went.

I was never able to agree with Dr. Robert Koch's contention that human and bovine tuberculosis were altogether dissimilar and not transmissible from one species to the other. I had to admit that my authority, from a scientific point of view and from a world point of view, was not nearly as good or as worthy of respect as that of Robert Koch, but I kept my opinion just the same, and, as time has gone on, it is very gratifying in one sense to know, although in another sense I would very much rather have known I was wrong, that the scientific world has come around to my view and has entirely abandoned the view of Professor Koch. In other words, there is not to-day, so far as I know, a medical scientist of any standing who is not convinced not only that bovine tuberculosis and human tuberculosis are one and the same disease, but that there is—mark. I am going to be very careful in the word—very good ground for the belief that bovine tuberculosis is the motherlode, the original form of all tuberculosis, and that if there had been no bovine tuberculosis there would never have been any human, any porcine or avian tuberculosis.

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While it is very difficult, indeed, to transmit human tuberculosis from the human being to an animal of any other species, and it is very difficult to transmit tuberculosis of hogs to any animals but hogs, it is, on the other hand, quite easy and a matter of every day occurrence for bovine tuberculosis to be transmitted to animals of almost every known species.

Now, it is true that there is what is known as a morphological difference between the bacillus found in human tuberculosis and the bacillus found in bovine tuberculosis just as there is a morphological difference in the bacillus of avian tuberculosis as compared with the bovine bacillus and the bacillus of human tuberculosis. Statistics show that up to sixteen years of age a very large percentage of cases of human tuberculosis which are examined microscopically are infected by the bovine form of the bacillus; that after sixteen years of age in human beings the number of cases of tuberculosis, in which the bovine bacillus prevails, becomes constantly smaller, and the number of cases in which the human bacillus is recognized becomes constantly greater as age goes on. It is not well to jump at conclusions, sometimes one lands on one's feet and at other times otherwise. At first our scientific friends jumped to the conclusion that the bovine form had a special affinity for children and young people, and that they were peculiarly susceptible to its attacks, and that older people only became affected with the human form of tuberculosis and were practically immune to the bovine form. Then they discovered that an enormous percentage of human beings are tubercular, some authorities claim 80 per cent, but anyway, well over 60 per cent of all human beings in civilized countries are tubercular, that is sixty out of every hundred people at least have got the germ of tuberculosis somewhere in their systems. That has been shown by the post-mortem examinations held in hospitals throughout the world on the bodies of people who have died from every imaginable cause, who have died from accident, who have died from suicide, who have died from typhoid fever, pneumonia and other diseases. I have no doubt some of them had been in the habit of attending conventions and were talked to death. The post-mortem examination of these bodies revealed the scientific fact that people were carrying tuberculosis with them through life, while eventually dying from other diseases. The disease became encysted, as it were, locked up, and in a great many cases was comparatively harmless, although as a result of an attack of congestion of the lungs or a severe congestive chill, acute tuberculosis might develop, sometimes very rapidly.

Medical men and scientists put their heads together and then they began to realize that the great majority of these people become affected in childhood, a very large number in infancy, and carry the germs on through life from that time. You and I have often been surprised at the revelations of the post-mortem or the slaughter house in the case of cattle that no one would ever dream were affected with the disease. It was realized that the great majority of these human cases contracted the disease in infancy and contracted it from bovine sources. They contracted it from the milk of cows. It was found that the milk from the tuberculous udder was practically certain to produce tuberculosis in a child. In Denmark, they do not allow the calves to drink the milk from a re-acting cow, but such milk goes into town and is sold for consumption by the children. If we want to raise healthy calves we cannot allow them to drink milk from re-acting cows. If we want to keep our hogs healthy and free from tuberculosis we cannot allow them to take milk from re-acting cows. Our medical health officers are not so particular, and in the great majority of our communities, and especially in country districts, no precautions whatever are taken and the consequence is that little children are taking the milk from these tubercular cows right along.

I am going to show you something else that is a source of danger. It is quite true that in the milk of a great many cows which re-act, if drawn from the udders under proper precautions, it is impossible for the bacteriologist to discover any tubercle bacilli, but that milk, as it is offered usually for sale for commercial purposes

is infested with tubercle bacilli. Taken from the udder under aseptic precautions, it contains none, but taken from the udder under ordinary conditions, it becomes charged with the bacilli of the disease. How does that happen? It is one of those disgusting things that one does not want to talk about, but it is just as well to understand it. It may be that the cow has open tuberculosis, or an abscess in her lung, or in one of the glands in the chest, in the thorax; you have seen them sometimes, they are as big as your fist, sometimes as big as your two fists, sometimes they are as big as your head. You have all seen these dirty masses when you open one of these cows. These open abscesses, especially if in the lung, frequently communicate with the air passages. The cow is a very clean animal and she does not spit, but as a rule, she swallows the discharge from the abscess when it is coughed up and it goes down through the wonderfully arranged stomachs which our bovine friends possess, on through the bowels and becomes mixed with the manure and passes out in the usual way. Some of it gets on the tail and it is flicked onto the flanks and the cows lie down in it in the stable. The milker comes along and some of it is on the udder and it gets into the milk, lots of it; you know it does.

Milk affected in that way is one of the most effective agents in spreading tuberculosis, not only among human beings but among calves and pigs as well.

My friend, Dr. E. C. Schroeder, Superintendent of the United States Experimental Station at Bethesda, Maryland, who is one of the most painstaking and conscientious investigators whom it has ever been my privilege to know, tried an experiment a few years ago in the feeding of pigs with butter made from milk containing tubercle bacilli. He took four pigs and he fed three of them an ounce of butter a day. They were kept under absolutely aseptic conditions, there was no possibility of infection in any other way. He fed three of them an ounce of butter a day made from the milk of the tubercular cow; he made sure that the milk contained tubercle bacilli before he made the butter; he did not give any butter to the fourth pig. The three pigs contracted tuberculosis in a very few weeks, the fourth which pig did not get that ounce of butter did not contract the disease. That is simply an illustration of what is going on all the time. You all know there is a very strong resemblance between the internal economy of the pig and that of the human species. If three healthy hogs can become infected by daily eating one ounce of butter it does not require a philosopher to understand the very real danger which we, and especially our children, are encountering when we use as little precaution as we generally do in regard to the consumption of dairy products.

Not only is it the case that human beings are infected in childhood, when the milk diet is most common and when they are most susceptible to infection, but there is another phase of this transition, of which I told you a few moments ago, as occurring from about sixteen to twenty years of age. The tubercular bacillus is not immortal; like you and me he dies when his time comes. The morphological characteristics which, after a while, become identified with the human species are certainly acquired, because you can take the bovine species of bacillus and plant it in another animal and after a time it acquires the morphological characteristics of the bacillus of that species. You can take the human form of bacillus and plant it in the bovine, and after a number of generations it takes on the morphological characteristics of the bacillus of the bovine species. I would point out that children who should be nursing but who are taking the milk of a diseased cow instead, usually contract tuberculosis of the bowels; a little later they are apt to take post pharyngeal tuberculosis and get these lumps in the throat, which sometimes go away and sometimes have to be removed. They are very disagreeable and a great many people don't know what they really are. Then in children older still, about seven or eight or nine years of age the disease may take the form of tubercular meningitis, inflammation of the covering of the brain and spinal cord, because it is just at that age that the flow of blood is greatest through the brain, owing to the development of that organ going on

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at that age. Again a great number of children become infected whose parents never suspect that they are infected. A child takes a little fever, the temperature goes up, the doctor comes in and looks very wise and gives a little quinine or something and the temperature goes down in a few days. Nobody realizes that the child has become infected with tuberculosis. After a while the symptoms pass away and the child goes along but it is a little delicate, puny child that is never strong, never healthy and never happy. The child does not know and its parents do not know that that is the time when tuberculosis became implanted in its system.

If you transplant the bovine bacillus from a cow to a child it goes on reproducing itself, but after a time it gradually changes from the bovine shape to the human shape, so that even if children are infected with the bovine type, by the time they get to be sixteen or twenty years of age the bacillus has accustomed itself to its surroundings, has taken on the morphological characteristics of the species of the animal in which it has found its habitation and it is, to all intents and purposes, the bacillus of the human kind. Scientists have recognized all these points now and, as I have already said, there is a deep and constantly growing conviction that bovine tuberculosis is the mother of all tuberculosis and that to it is traceable the disease, no matter in what species of animal it may be found.

We have in Canada a good deal of human tuberculosis; we have a good deal of bovine tuberculosis. We have, as you know, had a meat inspection service in force for the last four years. You will find on the seats a little book giving some information about the meat inspection service, which it became my duty to organize and of which I have had general supervision. We find a good deal of tuberculosis in the various abattoirs which are under supervision and control. Of course, we do not have an opportunity of seeing anything like the total number of tubercular cattle and swine that exist in the country because we do not inspect everything. Under the Dominion Act, we have only the right to maintain inspection in establishments which are engaged in export or interprovincial trade. We have no right to inspect animals slaughtered in establishments which do not engage in interprovincial or export trade. A man can kill in his own slaughter house almost anything he likes as far as we are concerned, provided he does not ship anything out of the province in which he lives. Of course, you understand that everything and anything that goes into an establishment of which we have charge, is inspected, whether it finally goes out of the province or not. The ordinary butcher is not subject to inspection, and as you all know, there are in almost every community, butchers who deliberately buy up animals of that class and slaughter them and trim out the diseased portions and offer the rest for sale, and your wife and my wife and the other man's wife go and buy it and it is taken home and eaten.

I have some figures here which are rather interesting. In the year 1908, we supervised the slaughter of 298,241 cattle. Of these 1,388 were totally condemned for tuberculosis. In 1909, we supervised the slaughter of 381,789 cattle, and of these 1,697 were totally condemned for tuberculosis. In 1910-11, we supervised the slaughter of 405,339, of which 1,492 were totally condemned on account of tuberculosis. Totally condemned for all causes in the fiscal year 1908-9, were 4,566; of these there were 2,570 sink veal calves which cannot fairly be reckoned in the count. Over 70 per cent of the cattle condemned that year were condemned for tuberculosis. The next year 69 per cent, and last year 66 per cent of all the cattle condemned were condemned for tuberculosis. Further, out of the 298,000 cattle that were slaughtered in 1908-9, in addition to the 1,388 which were totally condemned, there were 7,780 found to be affected with tuberculosis, which made 9,000 head of cattle out of that number found to be affected with tuberculosis. The figures run along for the various years in very similar proportions.

In swine, we find in 1908-09, out of 1,532,796 we condemned 3,009. The following year out of 1,260,000 we condemned 1,788. Last year out of 1,452,237, we con-

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demned totally 2,523. That is a small percentage. In 1908-09, .19; in 1910, .14; last year, .12. Of the total condemnation for all causes in swine in 1908-09, tuberculosis was responsible for 66 per cent; in 1909-10, 65 per cent, and in 1910-11, 72 per cent.

I have not said much as to the proportions of cattle condemned, but out of a million and a half in 1908-09, the portions of swine condemned for all causes was 199,149, of these 175,483 were for tuberculosis. In other words, over 88 per cent. The following year, out of 1,260,000 hogs, 227,966 portions were condemned, and of these 206,442, or 90.58 per cent were condemned for tuberculosis. Last year, out of 1,449,000, there were 318,705 portions condemned, and of these 295,925 were condemned for tuberculosis, or 92 per cent.

I am not going to take up your time reading figures, but it is easy for you to see that there is a tremendous loss. This is only a small part of the business of this kind which is done in Canada, and with that percentage due to this one disease it can readily be seen it is a cause of great financial loss to say nothing of the constant and ever present danger of spreading infection among human beings. Sometimes I get three and four letters in a day from people throughout the Dominion of Canada telling me that they have reason to believe that their cattle are affected with tuberculosis and asking me to take immediate action. I can only write and explain that we are not taking action at present in that particular way. I tell them what we are willing to do, but we have not yet undertaken to stamp out bovine tuberculosis in Canada. Many people wonder why it is that we do not do more in this direction. Tuberculosis is a matter which must be considered very carefully before undertaking to deal with it. One of the difficulties of Federal administration is that you cannot have one sauce for the goose and another for the gander; you must treat everybody alike, and if you are going to send inspectors and pay compensation to John Brown, you also have to send inspectors and pay compensation to Peter McDonald. It does not matter whether they live in Prince Edward Island, Nova Scotia, Manitoba or British Columbia, you must treat them all alike. When I came to Ottawa, the law said that if a man sold a tubercular animal he was liable to a fine of \$200. If any man found he had tuberculosis in his herd, or suspected the existence of it, and somebody notified the department, the department was, in law, bound to take action and quarantine his premises and do a great many other things. I looked at the situation very carefully, and I said, 'If there is anything on the statute book that cannot be obeyed, it had better be removed.' One of the things I have been very careful about is to try and eliminate from all my regulations anything requiring a man to do something impossible. Our statute books are full of such laws, and some people have regulations full of restrictions and most emphatic instructions to men to do things they cannot possibly do. I felt, so long as we were not in a position to deal with this disease in an effective way, we ought to assume a sane and sound position with regard to legislation and I had a little amendment put in, and, as a consequence, a man can sell, in good faith, any animal which happens to be affected with tuberculosis without running the risk of being heavily fined or sent to jail.

We began to count the cost of a policy of slaughter and compensation. You know what we have done with glanders. It was very desirable and proper that we should stamp out glanders. It was also a very good object lesson, not only to the Canadian public, but also to the veterinarians of Canada to see that a disease could actually be handled and stamped out. We have succeeded with several other diseases in a similar way.

I felt that we should do two or three things before we ever thought of dealing with bovine tuberculosis, and one of these was to educate the public and the veterinary profession to the belief that it was possible to achieve good results by sound, sane and intelligent policy in dealing with a contagious disease. Then I thought it would not be a bad thing to train a few of these veterinary surgeons and to make inspectors

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of them. The average veterinary surgeon is like other people. He thinks he knows everything and he is very often mistaken, very, very often mistaken, more or less seriously. Pick up one of these fellows and start him out with an Act of parliament in one hand and a gun in the other and a license to 'Sink, burn and destroy,' such as they gave the old privateers, and he is a more or less dangerous character. You must first teach him respect for the law he carries in his hand and his responsibility, and that he is not a law unto himself. He must be courteous and tactful and diplomatic and persuasive, and then, above all, he must have a back-bone like a bar of iron. You cannot find them like that every day. You have to look quite a while before you get one of that sort ready made. Even after you have put a few years work on him he is not always finished. We have been making these chaps right along for the last ten years, and we have got quite a little regiment of them now. Some are in the ranks and some are out of the ranks, some of them have gone back into private practice, and some have been promoted into higher positions, but they are all available in the country and they would form a nucleus for the tremendous army of officials who would be required if this department ever undertook to handle bovine tuberculosis on the lines on which glanders and hog cholera and some of the other diseases have been dealt with.

There are about seven million cattle in Canada. In the State of Minnesota there are something like three million cattle, and that state is one of the few which have attempted to handle bovine tuberculosis in an effective way. It has not done it. No community anywhere in the world has ever succeeded in handling bovine tuberculosis effectively. We have had some of the costliest legislation on bovine tuberculosis in different parts of the world, that it is possible for the mind of man to conceive, but none of these communities which have passed that kind of legislation have ever succeeded in getting anywhere with it. They have all had to repeal the legislation. A few communities have attempted sane legislation, and of these Minnesota is one, New York State is another, Wisconsin is a third. Minnesota has practically dropped her campaign, New York is doing a good deal of work, but it is only a matter of time before she will have to abandon her present attitude in regard to the disease.

The Minnesota people made a very careful calculation of what it was going to cost to stamp out bovine tuberculosis and eradicate it thoroughly in seven years, and the figures were, for the first year, \$7,553,650; for the second year, \$14,703,540. For the seven years it was going to take to complete the work \$35,004,260. Now the total value of all Minnesota's cattle in 1908, was \$37,197,198. The present value is about \$50,000,000. It was going to cost \$35,000,000 to stamp out tuberculosis according to the most careful estimate they were able to make. So you see it is not altogether a problem for the school boy; it is a very serious business.

I was a couple of years ago, by a peculiar set of circumstances, over which I had no control, placed in the position of President of the American Medical Veterinary Association, which is the largest body of the kind in the world and the most aggressive. For a number of years there has been in that body more or less discussion of the problem of bovine tuberculosis. Now, I happened to know that my probable successor as president was going to be Dr. A. D. Melvin, Chief of the Bureau of Animal Industry in the United States, and a very progressive and effective man. I had been studying the problem of tuberculosis even before I came into the service of the government. My old friends will remember the time when we used to talk about it out west, twenty years ago. I felt the opportunity was too good to be lost; I knew, regardless of who the man might be, how clever he might be, or what official standing he might have on this continent or elsewhere, that if any one man got up and propounded a policy in regard to the control and eradication of bovine tuberculosis, he would have more critics than supporters, and that a very large proportion of the veterinarian and medical authorities on the continent would start after his scalp and would pound his

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policy until he would not know it. I knew the live stock men and the health authorities and medical scientists would all be taking a crack at it, and I thought the occasion was a very auspicious one and I started to work and succeeded in getting the American Medical Veterinary Association to appoint an International Commission on the control of bovine tuberculosis. I happened to be the head of the veterinary sanitary service of the Dominion, and being succeeded in office by the head of the veterinary sanitary service of the United States, I thought it would be a good excuse to get the Departments of Agriculture of both countries to lend their support and countenance to the scheme and to help us with the financial end of it and make it possible for us to propound a policy which would, to a certain extent, be a joint effort. By the careful and judicious selection of the members of the commission, it might also be possible to include among them a considerable proportion of those who might afterwards be dangerous as critics, if they were not criticizing themselves. If you will look at the list of the names of the men who form that commission, I think you will agree with me, that there are comparatively few men in America, either in or out of the veterinary profession, who would venture to get up and criticize the policy which has their endorsement and support.

It would not be fair to take up your time explaining the various things which are in that report, you have all got a copy. I have only this to say,—that there is in it something that I would like to read because it has an important bearing on the whole thing. It is at page 13, 'The best law ever framed can be made an utter failure by stupid or injudicious administration, while, on the other hand, the most drastic legislation can be rendered acceptable if enforced with reasonable tact and diplomacy. Provided, therefore, that these qualities combined with integrity, thoroughness and determination, are available for administrative purposes, the members of the commission are convinced that the enforcement of a law based on their recommendations, will prove to be by far the most powerful and effective, educational agency which could possibly be employed.' My reason for reading you this is that we have been for ten years educating the Canadian stock-owning public, so far as regards veterinary sanitation on what, to the best of our judgment, we have considered to be sane and sound lines. We have not made any startling announcements during the last ten years. We have not told you any fairy tales and we have not compelled you to listen to any ghost stories. We have worked steadily and faithfully and honestly to overcome the various animal plagues which have been affecting your stock, and it is a great source of satisfaction to me to realize that our efforts have been appreciated in a most extraordinary and gratifying way. We feel that it is a great compliment; we know that we are a source of irritation to the stock-raising public; we know that we stop trains and steamships and walk onto a man's farm and kill his horses and his hogs and insist on dipping his sheep or his cattle when he is quite sure they do not require it. We quarantine his premises, interfere with his sales and generally treat him in a most unfriendly way, and when we realize that we have been doing that sort of thing for years and that you are still friendly to us and that you understand that we are doing our best and that the work is necessary, painful though it be, it is very gratifying indeed. We appreciate very highly the assistance you have given us and the loyal support, which is constantly becoming more loyal, which we receive from you. Knowing, as I do, the confidence now reposed in the work of the Health of Animals Branch, I believe that a careful, sound, conscientious policy, carried out on the lines suggested in that paragraph which I just read, would with the support of the stock-owning public of Canada, bring about in a comparatively short time the most gratifying results in the way of a reduction in the prevalence of bovine tuberculosis. If we took the attitude that tuberculosis is a disease dangerous to cattle and hogs, and if we followed them back from the slaughter house as we are now in a position to do, and found the owner and had a good long talk with him and explained the situation to him and put him under a certain amount of restraint and

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arranged matters in the way of compensation and so on, we would soon get the public on our side, and once we had that it would only be a very short time until the movement would become almost voluntary, and the people would be so pleased at getting rid of the disease that they would be taking the greater part of the onus and work out of our hands. I feel satisfied of that and I know my own Canadian public well. I have driven in and out of Canadian farm yards for twenty-five years; there are some things I do not know about the Canadian farmer, because he, after all, is full of surprises, but still, there are a great many things I do know about him and I am satisfied this can be done, provided it is gone about in a right way and it won't cost thirty-five million dollars either.

I want to tell you about following these hogs back from the slaughter house, I have the figures here. I am not going to show them to you because I don't think it is fair at this stage of the game. There are certain districts in Canada where the percentage of tuberculosis among hogs is appalling. We know where the hogs come from. Every hog is killed under the eye of one of our inspectors and we find that by far the heaviest percentage of tuberculous hogs come from these districts where the hogs and the cattle run together. That is the experience in the middle west of the United States also. The next heaviest percentage is found in the co-operative dairying districts where the milk is taken to the creamery and the skim milk is taken back and fed to the hogs or to the cheese factory where the whey is taken back to the hogs and so on. There are a few districts where the milk is pasteurized and where the trouble shows a remarkable diminution. There is this difference between bovine tuberculosis of cattle and bovine tuberculosis of hogs; because it is almost always bovine tuberculosis in hogs. The disease develops very rapidly in the hog and the hog does not live long enough in this packing-house country to break down with it, and we get him before the disease has advanced so far as to render the carcass useless for food. We find that those hogs that come from districts where pasteurizing of the whey is going on are rapidly assuming a better position. Of course, there is tuberculosis among the cattle, but we do not see so much of it among the hogs. One badly diseased herd of cows in a district, where they are sending the milk to the factory, will infect the whole district unless great care is taken in the distribution of the by-products.

In the third place we find that the pure-bred herds of cattle are, in many cases, responsible for the increased percentage of tuberculosis among hogs coming from certain districts. These are all points that have to be considered.

Now, Mr. President, I think I have worn out the patience of the audience. I have not covered the subject; it would take a month to do that, and I do not suppose you want to stay here for that length of time. If there is any other information you would like to have, or if any one would like to ask any questions, I shall be only too glad to answer if I can.

THE CHAIRMAN.—If there was any one in this house who was not convinced that we are up against a big problem, I should think he would be convinced after hearing the able address delivered by Dr. Rutherford. The question is before us and it has got to be dealt with. There are scores of men in this audience to-night who know that this is a very serious matter, but they would very much object to coming on this platform and giving their experience with regard to it. It is causing an immense amount of loss to the stock of our country.

A MEMBER.—Has the doctor made any arrangements to have a tuberculous animal slaughtered during the sessions of the convention?

DR. RUTHERFORD.—I am sorry we have not made that arrangement. I did at one time think it would be a good thing. The man responsible for it not being done is Mr. Ruddick. He assured me that it was quite impossible to give us the use of this hall any longer than two days and I was compelled to forego making the necessary arrangements. Mr. Ruddick begins a fruit conference on Wednesday.

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Professor DAY.—I am not sure that I have any questions to ask, but, I think, possibly, that a little of our experience might be helpful to some of those present. I am sure that no person present ever listened to a more lucid discussion of the tuberculosis problem than we have the pleasure of listening to to-night. I feel that it would be a pity if the subject were allowed to drop and not pushed a little further. During the past three years we have been following what is known as the Bang system of dealing with tuberculosis. During that time we have made about four hundred and fifty tests, some of these, of course, are re-tests of the same animals. Never in any single, solitary instance have we seen any injurious effect upon the animal tested. The more you study this question the more you find out that it is somewhat puzzling, and the more careful you are at jumping at conclusions. There are a lot of problems that come up. One of the peculiar things is the fact that some animals have remarkably resistant powers as regards this disease, and others again will contract the disease on very slight exposure. We have had some remarkable cases of that kind. The weak point of the test, as I see it, is simply this.—it does not tell you a single thing about how bad the animal is. If there is the least speck of tuberculosis in that animal it will give you just as marked a re-action and possibly a more marked re-action than one that is decidedly badly affected. And we have found that clinical symptoms are a pretty unsafe guide with regard to matters pertaining to tuberculosis.

Somebody suggested having an animal slaughtered for demonstration; you might hit it and you might not. During the last three years we have taken some forty post-mortems on animals we had tested, besides a number of post-mortems on animals we had not tested, and we struck some rather peculiar things. I remember one cow in particular. The first time we tested her two years ago, she gave a rather doubtful reading. She went up to about 103. We were making a test of the herd and we put her in with the infected bunch. The next time she gave a decided re-action. We tested every six months and I think she gave a decided re-action twice. She had a badly affected udder and finally got so that she would hardly give any milk—we would get a little bloody material from the udder. She went down in flesh and she was just the animal that most people would select for a demonstration here. In the post-mortem there was no tuberculosis in her udder; you never saw a more perfect liver and set of lungs. The only tuberculosis we could find in her at all were a few deposits in some of the glands and gullet, the most disappointing exhibition of tuberculosis I ever saw considering the nature of the cow. One peculiar thing about the test is that, in animals under a year old that re-act to the tuberculin test, we have been very unsuccessful in finding the disease in the animals at all. It may have been there, but we could not find it. Therefore, I am always sceptical regarding re-action in the case of young animals. We had one cow that passed the test four times, and the fifth time, owing to a bent needle, part of the dose was lost, and she got a second dose to make sure, and that time she did re-act. If you wanted an excellent exhibition of a tuberculous cow that is the one you should have selected, and she stood right in the stable passing the test time after time. In the great majority of cases the test will indicate the presence of tuberculosis or the absence of it, but the weak point of it all is that it does not tell you how badly affected the animal may be. We have had considerable experience in buying animals and applying the test to them. If we go out and buy a cow from a farmer who is careless about his stock, we are pretty sure to get a cow that will pass the test. The cow I am always doubtful about is the cow that comes from a herd that is closely stabled and kept under what we call the forcing system. It is stated that tuberculosis is most prevalent in pure-bred herds. I would not like to say that is absolutely correct, but I would say that I think it is most prevalent in the herds where the owner is afraid to let them outside for fear that he will hurt them. It exists in those herds where the owner is especially careful and babies the animals right from the start. You should be afraid of that kind of herd when buying a cow.

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We had a little experience of our own in that respect. To my absolute knowledge there was more or less tuberculosis in the two herds on our farm as far back as twenty years ago. In one herd, eighteen or nineteen years ago the test was made and a large number of the animals re-acted, and all the re-actors were slaughtered and by the time they got through slaughtering there were not many left and the post-mortem showed that there was very little, if anything, wrong with them. Some of them, of course, were advanced cases. The trouble was that the test was not followed up and things went on as they were before. These two herds, as far as I know, have been equally exposed to the disease, and that has been going on for nearly twenty years. In one of these herds thirty-eight animals were tested and thirty-nine per cent of them re-acted. Now that is bad enough. In the other herd, thirty-five animals were tested and sixty-eight per cent of them re-acted. The herd where thirty-eight per cent re-acted was kept in a miserable kind of stable, not well lighted and not well ventilated and rather damp. It was condemned by nearly every stock man who went into it, and yet there were fewer animals re-acted in that herd than from the other stable where the ventilation was better and where the conditions were much better in every way. What was the difference? One herd was let out in the air every day for a short time and the other herd was kept in the stable throughout the winter, and that is the only difference I know of in the handling of the two herds.

A MEMBER.—Did the cattle get watered out-doors?

Professor DAY.—No, both herds were watered inside. The point I want to make is this: that it is possible to raise healthy animals from infected animals, even badly infected animals. We have demonstrated that to our satisfaction. We have some very fine heifers now, whose dams were tubercular, and I do not think we have had a single re-action from these heifers. They were taken out of the re-acting herd and fed upon the milk of cows that did not re-act and they came through healthy. We have never discovered tuberculosis in a very young calf, even though the dam were very badly affected. Because the mother of the calf is tubercular it does not follow that that calf has a weaker constitution than a calf from a perfectly healthy cow, provided that calf has not been fed on tubercular milk but on sound milk.

A great many people are afraid to undertake any method of eradicating tuberculosis in their herd, because they are afraid they will suffer by the ignorance or prejudice of their neighbours. While I think the most perfect system, possibly, is the one outlined in this pamphlet, yet I think a man can take a herd badly affected with tuberculosis and in the course of years he can practically rid that herd of tuberculosis without following the Bang system in its completeness.

I would insist on certain things, one of them being that the stable should be perfectly ventilated and that the cows should get out-door exercise. Some cows have more resistant powers to the disease than others, and we should try to develop that power. How can it be developed? It seems to me something like this: We should give them rational treatment and take the calves and put them in a separate building and feed them upon milk from very sound cows, or sterilize the milk and thus raise healthy young animals to come back into that herd. While some of them will contract the disease, others will escape, and I believe that in the course of years a man would rid his herd of this disease.

If these young animals are kept in a stable with tuberculous animals and fed upon the milk of tuberculous animals, the wonder is that any of them escape, but even under these conditions, some of them will escape. Therefore, if you give them favourable conditions, the chances are you would not have a single unhealthy calf coming into your herd. It is not so effective a method as that outlined here, but at the same time I think it is a method that anybody would be wise to adopt if he has any suspicion that he has tuberculosis in his herd.

Mr. S. SMITH, Dewdney, B.C.—What would you do with the milk from these tuberculous cows?

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Professor DAY.—Sterilize it and it is all right. It is just as good as any other milk; that is what we do with the milk from our herd.

Captain TOM ROBSON, London, Ont.—You would let the calves from these cows suck their dams for two or three days?

Professor DAY.—No, we do not; they probably take the first drink and that is all they get, and out they go into the other stable.

Dr. J. G. RUTHERFORD.—I am sure we have all appreciated what Professor Day has said, and I was very glad that he volunteered to take a hand in this discussion. The professor is right about ventilation, lots of fresh air. I suppose you have read the reports of the experiments we carried on over the river here, in which we kept a herd of infected cattle for three years absolutely in the open. They had a shed to sleep in. Owing to a misunderstanding the first year, the calves began coming in the month of December. The first calf arrived when it was 29 below zero in the open air. One amusing thing was, that these calves came with hair three and four inches long and they did very well. They were all practically tuberculous cows. One calf came from a tuberculous cow and died inside of six weeks of acute tuberculosis. Professor Bang, of Copenhagen, admits that perhaps one per cent of the calves from tuberculous cows are born with tuberculosis. That is a point that Professor Day should bear in mind; he has got that one per cent to figure on. He is quite right about the difficulty of being sure that you have a proper subject for demonstration, although a good deal can be done sometimes in making up one's mind about that by a careful clinical examination. That is one of the drawbacks of the tuberculin test, that the modern veterinary does not think it is necessary any more, to understand the clinical diagnosis of tuberculosis. He thinks all he has to do is to take a syringe and put the tuberculin under the skin of the animal and the operation tells him whether it has tuberculosis or not. If the animal was very carefully examined by one of our old-fashioned veterinarians he might find out whether he had a suitable subject for the administration of the test. We had a very handsome cow in that herd over the river; she re-acted and she was tested again six months later and she did not re-act. She was tested six months later again and did not re-act. She was tested at regular intervals for two years and did not re-act. We are great believers in the first test but not near so firm believers in any subsequent test of a re-actor. That cow was tested finally and re-acted. We were slaughtering them and this cow was slaughtered.

Dr. Trotter, Chief Veterinary Surgeon of the Corporation of Glasgow, and one of the best inspectors in the world, had put me wise to the fact that it was a good thing in cases of tuberculosis, where the internal organs were found unaffected, to go after the deep seated lymphatic glands imbedded in the tissues, in the meat as it were, as one very often finds them diseased. When we slaughtered this cow we opened her up; she had given a distinct re-action just a short time before but we could not find any tuberculosis at all, not a sign of it. One of our veterinary staff, who was with me, said, 'I don't suppose it is worth while going after these deep seated lymphatic glands in this cow but I thought it well to do so, and in the popliteal gland in one hind leg just above the hock, we found the germs. This gland, which is deep seated in the muscles, was as big as an English walnut and it was a mass of tuberculosis. You can imagine how a man would feel if he put his teeth through a thing like that when eating a piece of meat. That was the only place where the disease was found in that cow, therefore, you cannot always be sure, when you cannot find it in the internal organs that the animal is not affected.

When a man is cleaning up his herd, he must not take it for granted that an animal which has passed the test is safe to go into his herd. It is not unless it comes out of a herd in which he is absolutely certain that no tuberculosis exists, for this reason: There is a period of from eight to fifty days after an animal becomes infected with tuberculosis before the disease becomes so firmly seated as to enable that animal to re-act.

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If you buy an animal and it is already infected, and if it has been infected too short a time and the disease has not developed sufficiently, that animal is liable to come into your herd like a thief in the night and bring the disease and infect your carefully guarded herd. Then there is another point, you say we must isolate any new purchase. Yes, isolate them for at least three months, not only from your herd but from each other. Suppose you buy a dozen cattle and one of them is affected, then you have the other eleven exposed to the infection. I could not select a better illustration of the difficulty surrounding the elimination of tuberculosis than that one particular point.

FOURTH SESSION.

WESTERN BEEF CATTLE.

R. J. Phin, Moosomin, Sask.

In considering the question of western beef cattle, one's mind naturally reverts to the range steer. Unfortunately, the range steer, owing to a number of causes, will not be available for export in any large number in the future.

In the first place western beef consumption has very largely increased. For instance, it requires about 40,000 cattle for the mountain and British Columbia trade and, naturally, consumption has very largely increased west of the lakes. Export and local transportation facilities have been poor, prices up to the last year or two unsatisfactory, and finally the settler with the plough and in fencing of the drinking places has put on the finishing touches in forcing a large number of ranchers out of business. The western beef steer of the future must, therefore, come from the farms.

It is a fact that there are not so many cattle on the farms per farm in the west to-day as there were a few years ago. Farmers in the mixed farming districts of Manitoba and Saskatchewan have not found cattle profitable and thousands of head of breeding stock have been disposed of in the past five years. I will illustrate to you why beef-raising has not been profitable to the western farmer. A few years ago I brought my first winter-fed lot of cattle to Toronto—three cars—in March. Export cattle were worth 6 cents in Toronto, and I received $5\frac{1}{2}$ cents for mine of equally good quality when they left the west. It cost me $1\frac{1}{2}$ cents from Moosomin, Saskatchewan, to Toronto, for all freight and expenses including shrinkage, with a fairly good run, as runs go. That is, I was at a disadvantage with the Ontario feeder of $1\frac{1}{2}$ cents. On some other shipments I was from 2 cents to $2\frac{1}{4}$ at a disadvantage, and 2 cents would be a fair average difference. That is, with cattle 6 cents in Toronto they were worth 4 cents in the west, and with 5-cent cattle in Toronto 3 cents at Moosomin. These prices are not very alluring, and this is one of the main reasons why our farmers will not grow cattle. It cost me from Moosomin 1 cent for freight, feed, selling and other expenses. The other cent is lost from depreciation in quality, shrinkage in actual beef and the necessary shrinkage of cattle in transportation. The necessary shrinkage of cattle in transportation that distance, weighed full at both places, should not exceed 40 to 50 pounds, being less than one-quarter of a cent per pound on the value of the animal. The depreciation in value should not exceed $\frac{1}{4}$ cent per pound with good transportation. That is, we are losing $\frac{1}{4}$ cent per pound for actual loss of beef and consequent loss through depreciation in value and weight owing to slow transportation. Since that time I have on three different occasions taken my cattle to Liverpool and London and the same depreciation in quality is seen

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there. Our cattle, which, in Winnipeg, are fine and fat, present a sorry spectacle compared with American cattle. Once having seen them one is not at a loss to know why Americans are quoted so and so and Canadians are quoted so and so and ranchers so and so, and that the *Liverpool Meat Trader Journal* comments yearly at the end of the season, 'Canada still continues to send a large number of unfinished cattle.' The truth is, a large portion of them are unfinished en route, and I believe I am very conservative in my estimate when I say the unnecessary loss to the cattle industry of the west from slow transportation amounts to fully half a cent a pound on every hoof going out of that country, or seven dollars a head.

The railway company claim that eighteen miles per hour is the best they can do with stock trains. Local stock is handled on ordinary freight trains at from five to fifteen miles per hour. Why, when we took our stock and effects up to that country thirty years ago over the American lines, these appeared to have no trouble to make twenty-five miles per hour, and the change was very noticeable as soon as we crossed the border, as thousands of farmers will tell you. The whole trouble is, as far as stock trains are concerned, although we may put up a train of thirty cars the railway company immediately adds another thirteen to fifteen cars of heavy freight, making a train that is too long and unwieldy to make fast time even if the engine is powerful enough to handle it. A train of forty-five cars has too much slack in the coupling (about 30 feet) and will jar stock very badly if run at a high rate of speed. It loses too much time at all stops owing to its length and must take the siding when within fifteen to twenty minutes of a superior train, causing half an hour's delay, thereby spending far too much time on sidings for meets and passes. Local stock is picked up by way freights and heavy freight trains, and receives practically no consideration whatever over dead freight and averages, probably, eight miles per hour.

The railway company claim to reduce tonnage on all trains, having a certain number of cars of stock, by 20 per cent. This is practically no reduction at all of the length of the train since stock cars are 20,000 pounds capacity and average freight cars 60,000 pounds.

The whole situation appears to be that the railway companies have had more traffic than they could handle at most seasons in the past, and have been met with increased demands by their men and have resorted to the slow heavy freight as the most economical and practical means of handling the traffic offered. The live stock interests have suffered in consequence, and the service is less satisfactory to-day than it was years ago.

They have greatly improved their passenger service and have enormously reduced the cost of heavy freight transportation to themselves by better road beds, heavier steel, heavier engines, cars of twice to three times their former capacity, the use of the air brake, etc., but I am bound to say they have done little or nothing to improve the stock car or transportation of live stock.

They claim to wish to stem the tide of all wheat production and encourage the production of stock to keep up the fertility of the farms, and to lessen the enormous grain traffic thrown on them in the fall and winter months, and offer to furnish demonstration trains to our governments to encourage mixed farming. Let me say to them and to you that the first essential to get farmers to raise cattle and go in for mixed farming is good transportation for our stock. What we must aim at, I believe, and I have given the subject a good deal of consideration—have been over the road a good many times to Toronto, Montreal and London, and know the conditions fairly well—is for our stock to be handled on passenger time. If they will reduce the length of stock trains to from twenty-eight to thirty cars I believe they can easily make passenger time, in fact they have done so at various times in my experience when stock has been delayed and the mischief was done and I could reach the proper official.

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What I would suggest is that the live stock interests combine in an effort to secure stock trains to be handled on passenger time, and on all main lines a daily scheduled train to run at passenger time to pick up local stock on all divisions on which stock were offered.

Then we should have a chilled meat system established as early as possible. Although the British people have been very prejudiced against frozen and chilled meat, yet they are year by year using it in larger quantities at higher prices. The demand is less and less for home killed, and it takes a very limited number of live cattle to break that market below a profitable basis to-day.

Next as regards production we should show farmers the advantages of better summer and winter-feeding their cattle, and thereby reduce the flood of half-fat stock on our markets and bring stock in to winter or for sale in good shape.

A few years ago I was forced to consider this matter of better summer-feeding to act as a sort of safety valve in my business. One fall, after a poor cattle season, I found myself in this position. I exported three hundred head at a loss of ten dollars each and had four hundred head left. Of these I wintered one hundred and fifty, and winter-fattened two hundred and fifty head. I succeeded in fattening them, but owing to shortage of water and the large number I was forced to market them in February and March. Owing to low prices and very bad transportation of one shipment they were not profitable. I wished to provide against this condition of affairs.

In that country almost all farmers bare fallow their land every third year. I fenced my fallows yearly after that until the farm was fenced, taking in any adjoining broken land, and grew rape on them and have never had a bare fallow since and sometimes had as much as two hundred acres of rape.

I plough my land, if possible, in the fall, and if not, as early as possible in the spring, and give it surface cultivation and packing till the last week in June or first week in July. May and June are our best germinating months for seeds, as through July and August it is often too dry and later too cold for germination. Therefore, I get rid of most of the weeds by the first of July, get the soil in a thorough state of cultivation and sow a rape in drills on the flat thirty inches apart with an ordinary grain-drill and two pounds of seed per acre, using scorched seeds or any other material of similar weight to the rape seed in equal quantities so that it is not necessary to set the drill so close, as to cut the seed to sow as low as two pounds per acre. We run a one-horse cultivator once through to kill weeds, promote growth and conserve moisture. We sow in drills and cultivate once, because if you were to sow broadcast and allow all weeds to grow your land would be sucked dry. Unless the land was very rank the succeeding wheat crop would be unsatisfactory.

As the rape grows rapidly we turn on the cattle about the middle of August. We turn them on any time except early in the morning when the frost is on. After that we let them go at will, but always try to have some grass pasture as well as the rape, as they require something to hold the rape, and they will be found a large part of the time off the rape. I would advise sowing about one-half an acre per head and have had no trouble whatever from bloating.

There are many advantages in having this succulent feed for cattle. Most of our farmers, who have not got a free run, have their cattle in small fields or herded, and the cattle do little good after the middle of August either in growth or fattening. The frosts come on, the grass becomes dry and pasture bare, cattle fail and cows fail in their milk.

With the rape, the cows keep in full flow and there are no bad results to the milk if the cows are taken off an hour before milking and are not allowed on the rape at night. The young cattle grow and improve in condition, and the stock to be turned off are either in prime condition to winter-feed or sell and the owner is in the best possible position. If he decides to winter-feed, his cattle are in the best possible shape provided he starts early and does not allow them to go back. Every experienced feeder

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will tell you that it takes the best part of a month to get a beast well started that has once commenced to go back.

The rape-fed steer, like the steer that has had a free run, will take on flesh at once. He has a big liver in him and his organs and digestive system are in shape to make the most of his feed from the start. All he requires is sufficient to keep him improving and then finish off at the end, which is vastly different from attempting to put on flesh and beef on a run down steer, which is far too common a western practice.

There is also another advantage in the land being packed and the excess moisture taken out of it. The wheat crop from many of our summer fallows is unsatisfactory, owing to too rank growth of straw causing late ripening, rust, lodging and consequent poor filling. Seeding some forage crop and pasturing results in a shorter stiff straw, which ripens early and fills well and has been with me invariably clean.

It may be thought I have dwelt more fully than necessary on this subject of growing feed on our summer fallows. Our Manitoba and Saskatchewan farmers are wedded to wheat. We have the wide open area and it is through wheat production they are in the prosperous condition in which thousands of them are to-day. Therefore, it is impossible to induce them to raise cattle unless it can be shown that by having their farms fenced and by growing some feed on their fallows they will save work in the destruction of weeds, pack their land and insure an earlier wheat crop which can be handled at less expense than the ordinary rank fallow crop and at the same time provide succulent feed for their stock. In this way there is some chance of gradually inducing them to raise more cattle.

Then as regards the wintering of our cattle; too many of our farmers feed straw, only with the result that the cattle make no growth and are much reduced to what they were in the fall. They look upon cattle as a sort of necessary evil and always appear to me to be trying to get something out of nothing. You may do that in western real estate, but it won't work out in the cattle business. I always make a practice of feeding my young stock a little green feed and grain with the straw, as we have no roots and little hay, and in that way keep them growing throughout the winter. This practice of failing to supply sufficient summer feed for cattle and wintering young stock on straw is one cause of our markets being flooded with half-grown, half-fed cattle. Our farmers in Manitoba, Saskatchewan and southern Alberta are the principal offenders in this respect, and only a very small percentage of export stock comes from the farms. Ranchers seldom market their cattle until they have sufficient age, weight and condition to market to the best advantage. They are also more careful about the breeding of their cattle and usually ranch cattle show good breeding. On the other hand, farmers have been reducing their stocks, looking upon them as being unprofitable anyway, and, consequently, they have become careless about the breeding of their cattle. This is a great mistake—an equally great mistake, too, is the failure to feed sufficiently to make proper growth. The two must go together to obtain the best results. No matter how well you feed you will not succeed if you have not got the breed and proper conformation, neither will you succeed with the best of bred stock without feeding sufficient to make continuous growth. I do not, by any means, mean that cattle should be necessarily pure-bred. In fact, I think it would be a great mistake for the ordinary farmer to start with pure-bred stock unless he was specially adapted to the business and was prepared to give them the necessary care and attention to obtain the best results. What I do mean is that he should use pure-bred bulls of good size and quality and improve his stock in that way. As to winter-fattening, I have done so in almost every conceivable way and find you can feed the big steer in almost any way provided he has water, shelter, plenty of feed and attention. I have fed them tied up and loose in stables, in outside sheds and in the barn-yard.

One winter I fed one hundred steers in the barn-yard without the sign of a shed and they did about as well as any inside cattle, had better digestion, required little,

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if any, more grain, but ate a great deal more straw and other roughage. One of the greatest drawbacks to winter feeding in that country is the water supply. Our country is not so well watered as eastern Canada and we have more difficulty owing to the severe frost. The best system I have found, where water has to be pumped, it to use a small gasoline engine and a large circular drinking tank, say eight feet across and two feet deep, two-thirds of which is in a tight, well-built pump house with a tank heater on the inside and lid to be opened and closed at will on the outside. This is where you have not good barns and cannot have your water inside on the Ontario plan.

It would be suicidal for any farmer to attempt winter feeding without an ample water supply, because it is usually necessary to feed into the May and June months to get the remunerative price. There are, therefore, to sum up, four main essentials to the increase of the beef cattle industry throughout the farms of the west.

1st. *Better transportation*, and this includes a chilled meat system.

2nd. Show the farmers the advantages of growing succulent feed on fallows, both as regards the grain crop and bringing stock in to winter in the best condition.

3rd. Show farmers the advantage of better wintering the young stock and of having stock to be winter-fed in a thrifty condition to begin feeding.

4th. Show farmers the necessity of greater care in the breeding of their cattle. It is only the well-bred, well-finished animal that will show satisfactory results in the long run.

WESTERN BEEF CATTLE.

Discussion led by Geo. Lane, Esq., Calgary, Alta.

I have been asked by your Executive Committee to lead this discussion on 'Western Beef Cattle,' and I have also been asked, as President of the Horse Breeders' Association of Alberta, to protect the horse interests. I am also Vice-President of the Western Stock Growers' Association, and that body has asked me to look after its interests at this convention. In taking up this subject of 'Western Beef Cattle,' I propose at the same time to express my views on mixed farming which is, after all, perhaps the most important phase of the questions under consideration.

Now, gentlemen, I have come down here from Alberta to try to protect the interests of the poor old cow, the animal which has driven the mortgage away from the farm, the animal which has made so many homes happy, and which, in spite of this, has been and is now being destroyed in the west in such a shameful manner.

Last year, 30,000 calves were killed in our western country. All these calves were still sucking their mothers and were all of the very best beef strains that could be produced. In addition to this I want to tell you that, at a very conservative estimate, at least 65 per cent of all the cattle that were slaughtered during 1911 in Alberta and British Columbia were she stock, and when I tell you that our western country is capable of carrying 300,000 to 500,000 head of beef cattle per year, you will, I am sure agree with me as to the seriousness of the situation.

We use in Alberta and British Columbia about 130,000 head of cattle per year, and in Manitoba and Saskatchewan, so near as I have been able to gather from the figures, about 150,000 are used.

The wholesale destruction has been going on for a number of years until we have dropped down to scarcely cattle enough for our own home use.

I have here the cattle export figures for the six years commencing with 1906. These show a steady drop each year down to 1911, and you will see that in 1911 these exports are less than 16 per cent of the number exported in 1906.

In 1906 we exported in all from Alberta.	74,733 cattle.
In 1907 we exported.	42,960 "

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In 1908.....	61,810 Cattle.
In 1909.....	67,257 "
In 1910.....	51,027 "
And in 1911, only.....	11,869 "

You will see that this decrease has been going on for a number of years, and that the exports for 1911 are less than 16 per cent of the exports for 1906, and in addition to this the export figures for 1911 are less than 25 per cent of those for 1910.

Now these figures show an enormous drop, instead of the gain we should have. When people started in to destroy their herds in Alberta, and by this I mean the spaying and beefing out of their breeding stock, I used to say to them, 'Now, this principle is wrong altogether'; and some of our best cattle men said to me, 'No, we can buy stockers cheaper than we can raise them.' I never believed this, although they used to try to prove it to me with figures.

Now the day has come when I do not know of any country where a man can buy steers to go on feed or on his range.

A few years ago I bought a bunch of cattle in old Mexico, and a short time ago I thought I would try to see if I could buy any more there. The price I was quoted this year for yearlings and two-year-olds was just three times what I paid seven years ago, and they seemed to be hard to get at that.

I see by the statistics of the United States that in that country there are 7,000,000 cattle less than there were ten years ago in spite of the fact that they have 21,000,000 more people.

Although we have been talking particularly of cattle, I wish, before going further, to draw your attention for a moment to the money we have paid out in the west for horses during the last two years.

We brought last year from eastern Canada 21,832 horses, which at an average price of \$275 means over \$6,000,000 of our money left in the east for horses during 1911. In addition to this 4,240 horses were imported to the west from the United States (without including horses entered duty free, as settlers' effects), and valuing these at the same average price this means that \$1,166,000 was paid by the west to the United States for horses during 1911.

In 1910, 33,571 horses were brought to Manitoba, Saskatchewan and Alberta from eastern Canada and the United States. At the same average price of \$275, a little computation will show you that in 1910 we paid out \$9,232,025 for horses from eastern Canada and the United States, in spite of the fact that there is not either in Canada or the United States (nor in fact in any other country), a place where the horse can be raised as cheaply as he can in Alberta and Saskatchewan, or where he will grow to be a better animal.

Now, as you know, I have been a breeder of horses for a great number of years; I have always been in close touch with the situation in the west, and I feel quite safe in saying to you that there is not, in my opinion, the slightest danger of overstocking horses in Alberta and Saskatchewan during the next ten years at least, on account of the land that will come under cultivation during that time.

Now, to take up mixed farming, I want to say first of all, that I think certain parts of Saskatchewan and Alberta are the greatest mixed farming country in Canada to-day, and I greatly doubt if their equal is to be found in the United States. The only State that I know of that equals it in any degree is Colorado, and you could put the State of Colorado in one corner of the Province of Alberta. I was told, however, two years ago that Colorado fed 600,000 lambs and about 120,000 beef cattle per year.

It was only last month that I went down into the Twin Falls country in the State of Idaho. In the Twin Falls irrigation tract, which is 40 miles long and 12 miles wide, I found 400,000 tons of alfalfa hay, and in the neighbourhood of one million sheep on feed, together with a great many cattle. I went down there intending to buy some wethers, and while there met a man originally from Kingston,

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Ontario, named R. F. Bicknell, who may, perhaps, be known to some in this audience. He offered me 20,000 head of two-year-old wethers, and was in a position at that time to sell me that number or twice that number.

I may say right here that when I got the railway rate and the duty and then figured this against the New Zealand mutton it put the deal right out of business.

Now, if I am any judge, we have in western Canada a better country than that, yet we bring 65 per cent of the mutton used in Alberta and British Columbia from New Zealand and the United States.

In addition I may add that we do not raise 25 per cent of the hogs used in Alberta and British Columbia.

My authority for the last statements is my accurate knowledge of the country, and I also have been told this by Mr. Pat Burns himself, and also by a member of the Swift's Canadian Company, and the authorities of the Canadian Pacific railway.

Now, if I were to go into details and give you the figures showing how much money we have paid for the hog products that are being brought in, and which should be raised in the country, you would wonder where we were getting the money from, for no man ever saw a business more thoroughly destroyed.

You may say to me, 'What helped to bring this about?' and I would have to say that, in my opinion, very low markets was the first reason for the wholesale destruction of the beef herds.

Then when the government put the two years' clause in the leases it had a great tendency to make cattlemen very restless. These men said they could not afford to take chances on keeping a large herd of cattle and being compelled to go out of business after a couple of years.

When the farmers commenced to come into Alberta and Saskatchewan, it was said and generally thought that there would be more cattle in the country when the farmers came in than when the big ranchers were running it. Now, in my opinion, this has not proved true, and it has never proved true anywhere in the United States. Texas to-day has 6,000,000 beef cattle, and the only state that has half that number is Kansas.

Now, on top of all this, there began to arrive in the west the men who made it a business to sell wheat lands. Now, I am sure I am not exaggerating when I say there are over eight thousand real estate men selling land in these western provinces, and it is safe to say that at least 95 per cent of them talk wheat and nothing else in their efforts to sell land to the people.

Now a great many people may know something about mixed farming, but they are continually being persuaded that 'wheat is king.'

After the land agent has done his part, along comes the steam plough agent, and the gasoline agent and half a dozen other machinery men (all these being, as a rule, very clever salesmen), and in turn each of these men advise 'raise wheat.' Why?—the first man wants to sell his land; the second man wants to sell his machinery. Nobody advises the landowner to carry on mixed farming.

Now, they get their wheat and lots of it, and along with the wheat also they occasionally get frost, which means tons of frozen wheat—but no cattle, hogs nor sheep to feed it to. In this I am speaking only of certain parts of Alberta and Saskatchewan.

Gentlemen, it is a crying shame that there is going to be hundreds of thousands of tons of feed burned up in our country during the coming spring. This will be clear loss, while the money we are sending out of the country is also lost, and I leave it to your common sense to decide whether or not it is going to need even a greater country than our western Canada to stand such extravagance.

You may ask, 'What suggestions have you to offer for the remedying of these conditions?'

First, I would suggest that the experimental stations should enter largely into the raising and feeding of cattle, sheep and swine, with the view of demonstrating

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the results possible from mixed farming. This will be bound to do a great amount of good. People have been talked to so much about raising wheat that they need to be shown plainly and with actual results what can be accomplished with carefully managed mixed farming.

The press can also help this work along by showing clearly, as they can show, where the advantages of mixed farming come in.

I am also of opinion that it would be to the interests of all the banks which have branches in the west to advocate to their customers the value of mixed farming. Something might also be done to help mixed farming by the banks as well as the loan companies by advancing money on good terms to their customers who carry a certain amount of stock each year.

We all appreciate very much what the railways have done in reducing the rates on pure-bred stock, and I feel sure they could be induced to assist in the matter of demonstration farms.

These demonstration farms are, in my opinion, doing a great work for the west. Now and then you will hear a man say, 'Oh, I would not listen to those professors with the stiff collars,' but you will find a great many others writing to these farms for information on different points. When a man gets this information he uses it, and his neighbour will soon be using it as well.

Now, right here I want to make another suggestion to help to encourage the live stock industry in the west.

I would suggest that in order to encourage the cattle, hog and sheep industry in Alberta, that the packing companies which are doing business in the west should each contribute the sum of \$1,000 each year for five years to the prize lists of the different fairs in the provinces, this prize money to be given for the best fat cattle, sheep and swine. This should do a great amount of good.

I would also suggest that in regard to homesteaders going in for mixed farming, it might be possible to arrive at some arrangement with the Department of the Interior, whereby it could be stipulated that men taking up land must have a certain amount of stock on the *leasehold* at the end of the second and third years. This might be accepted by the government in lieu of some of the other homestead duties now required.

Now, gentlemen, I have lived in Alberta for twenty-nine years, during which time I have been engaged in the general ranching business. I have seen a great many ranchers start in that country, and I want to say that I have never in that time known of three men who lost their money, where they carried on mixed farming, raising cattle and horses with sufficient fodder to take care of them, at the same time attending to their business, and spending their time looking after its interests, not loafing around hotels, barrooms or billiard halls.

On the other hand I have known of at least one hundred to one hundred and twenty-five men who came west and started at from \$10 to \$40 per month, who to-day are worth anywhere from twenty-five thousand to two hundred and fifty thousand dollars; some of them, indeed, have gone up to the million mark, about ten, of whom I have knowledge, having retired from business and gone to Victoria, while a number of the others have scattered to other provinces. I think I could tell you the names of every one of these men.

Just here I think it only fair to say for the benefit of the mothers and fathers of the boys who have come to us from eastern Canada, that these are the most successful men we have. While 95 per cent of them started right at the foot of the ladder, receiving, as I have before stated, only from \$10 to \$40 per month, they are men of whom the east might well be very proud.

I might also add before concluding my remarks, that I think it is only fair to the different breeds of cattle to name those breeds with which I have had the best success in Alberta. I think most of our western breeders will agree with me that the breeds giving most satisfaction in Alberta and Saskatchewan are the Shorthorns and the

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Herefords. I am of the firm belief that certain parts of the country are adapted for the raising of certain breeds of beef cattle just as much as certain parts of the country are better adapted than others for the raising of apples or peaches.

Now there has been a great deal of talk in our country as to what governs the price of cattle. It has been generally said that the abattoirs and packing houses govern the prices. Now, I do not think this is true. It may be true in some instances where men get into towns or cities with small shipments, but our market has always been governed by the export trade, as until last year when we only had a little over eleven thousand cattle to export it was impossible for the packers and abattoirs to tell just how many cattle were in our country.

Now, I know from my certain knowledge that one packer, who two years ago got more cattle than he could use, exported them himself and his actual loss was more than fifty thousand dollars.

A great many people here know the live stock export man, and do not begrudge any man the money he makes out of export cattle. I have exported a good deal, and I hope I will never have to export again under the same conditions as before. Now, gentlemen, we never get a steer from our country to the old country for less than \$28, and from that to \$32. Now is this not an awful tax on any country to have to pay to get to a market. The only remedy I know of is in the hands of the government, the railways and the steamship people, who by an earnest effort might reasonably reduce the expenses of transportation.

On the other hand, I do not think any man need be afraid to go into the export cattle business, as everything points to a continued shortage of beef in all countries, and especially with our population growing as rapidly as it is.

Now I do not want Ontario to think that the west is the only wasteful country. At their winter fair at Toronto a short time ago I saw beautiful Shorthorn heifers weighing from 800 to 1,000 pounds being sold to the butcher.

EASTERN BEEF CATTLE.

Mr. John Gardhouse, Highfield, Ont.

I take it that when the committee selected the subject, 'Eastern Beef Cattle,' the subject they have asked me to speak on, they had in mind the province of Ontario and the provinces to the east.

In dealing with this subject, I think it best to treat it by asking a couple of questions in commencing:—

First.—Are the farmers in eastern Canada breeding and feeding a sufficient number of beef cattle?

Second.—Are the animals that are being bred and fed as good specimens of the beef breeds as they should be?

First.—Are the farmers in eastern Canada breeding and feeding a sufficient number of beef cattle? My answer to this question is, 'No.' We cannot escape the conclusion that the production of beef cattle has not kept pace with other branches of the live stock industry. When we stop to consider the increase in the population for the last few years and the decrease in beef production which has taken place, it is quite evident that a wide gap may develop in the supply. The home consumption is growing much faster than the supply of good cattle. The shortage of beef cattle can best be judged from the facts that the prices for feeders this fall have been from $4\frac{1}{2}$ to $5\frac{1}{2}$ cents, and but few stables have their usual supplies. Inquire where you will from the farmer, the drover, or the buyer as to the outlook for good beef cattle and the answer is the same. There is every prospect of a great shortage in the near future. The scarcity of feed in Ontario is sending many cows and young stock to

the market in an unfinished condition, which is certainly going to have its effect on the future supply of beef cattle. The high price of land and the dairy demands have upset beef cattle breeding and feeding on many farms. In talking with a gentleman engaged in the export business for years, he tells me you may draw a line, say from Peterborough east and, owing to the great increase in the dairy business, there are practically no export cattle to be found. In fact, they are not, in all that section, raising enough beef cattle to supply their own requirements.

Second.—Are the animals that are being bred and fed as good specimens for beef production as they should be? My answer again is, 'No.' This is a question that our stockmen and farmers, as well as our governments, might well take into their consideration. The invasion of the dairy breeds has driven the dual purpose Shorthorn cow, in many places, out of the field. The fashion of the times has been to specialize along dairy lines, and the demand for milk products has been insistent, in some cases, to the detriment of beef production. It were far better that our beef supplies should come from our home farms, and, I think, the best system of farming to produce this is that of mixed farming with the large-framed, even-fleshed, big-bodied, deep-milking Shorthorn grade cows, bred to a first-class pure-bred bull, such as we used to find on many of our farms in older Ontario, as well as in some of the other provinces. When our supply of dairy products was not short, the stocker trade was always satisfied with the large, healthy, slick, well-fleshed calves that grew up to feeding age. They gave the breeder and feeder a good profit and produced as well a first-class carcass of beef for the consumer. I may say that in eastern Canada there have been four of the beefing breeds handled for the purpose of beef production, namely, Shorthorns, Herefords, Polled Angus and Galloways. I may also say that the large majority of our beefing animals have, up to the present time, been of the Shorthorn strain. In fact, in most of the beefing sections, until very recently, the foundation stock of breeding females have been entirely Shorthorns and their grades.

I wish now to give what I consider a few reasons for lack of progress in the beef industry.

First.—The indifference of too many of our beef-growing farmers. They do not manifest that degree of enthusiasm and love for their business which should characterize the action of men who are anxious to make the very best out of it. They do not exercise sufficient care and judgment in the breeding of their animals, and after they do get them, in too many instances, they are not sufficiently well cared for. Perhaps it would be interesting to know what a large percentage of our young stock are housed in the fall in fairly thrifty condition, yet when they strike the grass, the following spring, while they have grown, they have become so much shrunken in their general condition, that they are probably very little heavier than when they were stabled in the fall. Even after this scant nourishment during the winter, they are often not supplied with sufficient pasture during the summer. How then can we expect the best results from such treatment.

Second.—For a number of years, many Shorthorn breeders had become so engrossed in their desire to supply breeding males to the ranchers of the west that in their zeal they had almost forgotten that the Shorthorn was a milking animal. For years many of our breeders almost entirely overlooked this characteristic of the breed, with the result that when the general farmer and breeder of Shorthorn grades came to look for a pure-bred sire, he found it almost impossible to obtain one which he could rely on to transmit milking qualities to the offspring. He, ever mindful of the every day returns of a good milch cow, sometimes used sires of indifferent breeding, and very frequently, sires of the dairy breeds. Such a system of breeding could only prove fatal to the best interests of the beefing industry of the country. However, as the result of a determined agitation against the conditions in the Shorthorn world, there has been an awakening in the minds of our Shorthorn breeders along these lines, with the result that many of them are endeavouring to reproduce and make prominent the milking characteristic of the breed.

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Third.—Many agriculturists have been telling the farmers that it is impossible to get the beefing quality and milking quality in the same animal. No doubt they were honest in their convictions, and those convictions have had the effect of causing many of the farmers of whom I have spoken to feel that it was useless to look any more for the milking quality in the pure-bred Shorthorn sire, and so confirmed them in the use of those indifferent males.

Let us look for a moment at conditions in the old land. In that great home of the Shorthorn, we are told that upwards of seven-tenths of all the stock used for dairy purposes in Britain are Shorthorns and Shorthorn grades. We do not pretend to say that perfection of beef type can be quite so closely approached on the average by a dual purpose as by a special purpose beef strain; neither would we claim that quite as high an average of milk production can be attained as by the special purpose dairy breeds. What I do claim, and it is supported by abundance of evidence in England and also in Canada, is that a profitable combination of these qualities can be attained, which will suit the requirements of a great many of our farmers for the economical production of good, even-fleshed beef on high priced land.

Fourth.—During the past year or two, owing to the scarcity of feed and the additional demand for beef, animals much younger and in a less finished condition have been sent to the market. I have no doubt, when the returns for this year are issued, they will show a great shrinkage in beef cattle. In order to remedy these unfortunate conditions, and place the beef cattle industry in the forward condition which its importance demands, we must continue to preach the doctrine of more skillful breeding and a more profitable system of feeding and management than has been followed in the past. Could not our Department of Agriculture, with its high conception of the importance of the business, direct and convey these principles to the general public in such a convincing way that the farmers will realize that the breeding and feeding of first-class beef cattle is both interesting and profitable. I have often wondered if there was anything more pleasing to a real stockman than to go into his stable and look over a first-class lot of those well-bred, healthy, thrifty, broad-backed, even-fleshed steers that must give him a good return for his labour and money invested.

In order to make the beef business a success, we should never weary of emphasizing the fact that skill must be exercised in breeding, and that when the young animal is dropped it must be cared for and fed in such a way as will bring it to maturity as early as possible. If our farmers will follow along these lines in eastern Canada as well as in the west, there should be no scarcity of those good healthy animals that are good feeders and will produce those high-priced cuts and juicy steaks that are being sought after more and more each year, and which are very difficult to get at the present time at any price.

Probably, if there is one thing more than another, that should be pressed home to the farmers of eastern Canada, it is to protect and grow up every good heifer calf of the beef breeds that is dropped so that we may have a sufficient number of good females coming along in order that we may raise the class of beef which is now so much in demand in this country.

Discussion led by J. F. McLean, Harris Abattoir Company, Toronto.

I owe a word of apology to this meeting. I agreed about ten days ago to be present to lead in this discussion of Mr. Gardhouse's paper, but since that time I have been away on a business trip and have had no opportunity of consulting with Mr. Gardhouse. My remarks, therefore, will not be worthy of the occasion, but I trust you will accept this word of apology.

I presume this meeting consists almost entirely of breeders of live stock. The interest with which I am identified depends entirely for its raw material upon the breeders of live stock. The breeders' interest and the packing-house interest very

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rarely come into immediate contact as they do in this meeting, and perhaps those engaged in these industries devote less attention to the problems of each other than would be beneficial. The breeders of cattle and the packing-house men ordinarily come together only on the cattle market, and their attitude is determined to a greater extent, than it should be, by that fact. When you come on a market with cattle to sell, your interests and our interests appear at the moment to be diametrically opposed. I need not tell you that the packing-house man tries to buy your cattle for as little money as he can and you, naturally, try to sell your cattle for just as much as you can get, and it seems to me that the relation between the breeders and packers has been coloured by that circumstance to a very much greater extent than is necessary or is beneficial. We may as well recognize at the beginning that when we do come together to buy and sell, each will look after his own interest to the greatest possible extent, although, probably, in a broad sense, the interests of these two industries, in which each is depending on the other, must be identical.

I cannot tell you anything about the problem of raising cattle, but it occurred to me after listening to the addresses this morning that the cattle-raising problems were very much the same as cattle-killing problems, only there are different ramifications and different conditions under which each business is conducted. What are the main purposes by which a packing-house man seeks to guide himself in the conduct of his business? A packing-house man seeks volume. I do not want to preach to you because, perhaps, every man in this audience knows more about the cattle industry than I do, but it seems to me that on that point there is a divergence of opinion between the two bodies. I do not mean that the packer has any right to dictate to you, but the packer seeks always to increase his volume. He studies up the market and if he can do a greater business, whether the profits are greater or less, he is satisfied, and I think that would be a good principle for the breeders of cattle to apply to their business.

Mr. Lane mentioned that only 25 per cent of the hogs that are used in western Canada are raised in western Canada.

Dr. RUTHERFORD.—Twenty-five per cent of the hogs used in Alberta and British Columbia.

Mr. McLEAN.—There are farmers in Alberta and British Columbia that have a home market that must be profitable. If every farmer in Alberta and British Columbia set himself to the realization of that fact, they would certainly be able to make money. It may be that the conditions there make it difficult, but almost anything is possible if a man goes at it with the right kind of intelligence and the right kind of determination to stick at it once he has made up his mind that a certain line of conduct will be profitable.

The second note that I made is as to the purposes that guide the packing-house man in the conduct of his business. The packing-house problems are not essentially different from the problems of the stock breeder, because business is business all the world over and the principles that make for success are the same, and as Mr. Phin referred to the growing of rape and making use of his fallow land, I presume that land was none the worse for the growing of rape on it, but better. Failure or success in business depends on the management, and I presume this cattle-raising business depends on intelligent and energetic management.

The third point I want to make is persistency of effort. Letters written to the papers by cattle breeders or farmers very frequently complain that if they raise more cattle, the packer immediately puts down the price. Now the packer does not put down the price. He has to buy just cheaply as he can, just the same as you try to sell all the cattle you have at as high a price as you can. That is the principle on which business is conducted. I believe that the people who breed cattle and raise them are very much the same kind of people as those who kill them. The same characteristics predominate and, I believe, the attitude towards one another is of

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fairness, and there is no justification for the superfluous criticism of the packing-house man towards the breeders, and there is no justification for constant criticism on the part of the breeders towards the packing-house man, and I really do not think there is any such general attitude.

I spoke of persistency in the line of conduct. One cannot step in and out, one must not be deterred by difficulties and disappointments. Reference was made in Mr. Stevens' paper to the exporting of dressed beef. I do not believe the exporting of dressed beef from Canada to Great Britain is possible, and the reason it is not possible is that Canada's competitor for that trade is Argentina and South America, and they can raise cattle more cheaply than we can. The company that I am identified with was organized to carry on a dressed beef trade with Great Britain. For six months we booked space and made contracts for space on the ocean steamers and we filled out space, but we had to stop at the end of six months because we had no more money to go ahead with the business and the trade had to be abandoned. The only alternative we had was to go out of business or develop a home market, and we set ourselves to the development of a home market. That is the law of self preservation. You have got to make money if you are going to stay in the business.

I presume it is a fact that in certain years, the raising of beef cattle is not profitable, while in other years, it is a very profitable business. The man who tries to hit the profitable years and escape the unprofitable ones will make a failure. No man can predict the markets because, if he could, he would only have to stay in the business six months. The fundamental law of business is that a man must make up his mind what he is going to do and then set himself to do it as well as he can and not to be discouraged.

One principle on which packing-house business is conducted is the utilization of by-products, and that may be a feature of the stock-raising industry that, perhaps, does not get attention. If a breeder makes up his mind that a certain year has been unprofitable, has he sufficiently taken into account the value to his general business of the raising of these cattle? Suppose that his ledger showed he has a debit balance instead of a credit balance, he should take cognizance of the general advantage to his whole situation. I do not say that by way of instruction, but as a fundamental consideration in the conduct of business. The constant aim of the manufacturer is to make use of every bit of material that ordinarily goes to waste. A revolution has occurred in Canada in that respect in the last ten years. The Canadian packers deserve no credit for the conception of the idea; they simply followed in the wake of the American packers. The American packers discovered it largely by accident. One of the most important by-products from the killing of cattle is fertilizer. It amounts to hundreds of millions yearly in the United States, and that industry commenced simply through an accident. Perhaps not exactly from an accident, but because the utilization of these products was forced on the packers by the health authorities in Chicago. Year after year the health authorities were prosecuting the packing-house people for polluting the river. They used to run the blood and offal into the river and the packing-house men had to subsidize the police authorities year after year. They had to pay them immense sums to allow them to continue to run this valuable stuff into the river. One day a German chemist happened to walk into Mr. Armour's office and told him that he could make a valuable commercial product out of this stuff that they were running into the river, and out of that developed the fertilizer industry which is largely controlled by the packers of the United States, and the turn-over of which amounts annually to hundreds of millions. The packers then set to work immediately to see what they could do with this and that and they used up all the by-products.

That suggestion may be worth while to the breeders of cattle as well as to the killers of cattle. You cannot make money out of cattle like you can out of real estate. Any business some years will be good and some years bad, but the law of

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business is that the man who does a certain thing efficiently and persistently and with courage will ultimately succeed. There is no question in my mind that relatively cattle-raising is just as profitable as cattle-killing. I do not mean that a successful cattle-raiser will make as much money in a year as a successful cattle-killer. A packing house has a very much more largely and more widely extended business, employing, perhaps, 500 men. If a cattle-raiser were employing that many men he would probably be a very rich man. Some years cattle-killing business is profitable, other years it is not profitable. We do not 'holler' when we have an unprofitable year. The packing-house man is different in that respect from the breeder. The packing-house man cannot 'holler,' because if he does the banker gets after him and starts to withdraw his loan. The key note of the whole business is persistency and the application of the principle that constant improvement in business, by looking over new markets and by seeking to utilize what heretofore he has not utilized and by constantly seeking to improve the quality of the product he has to sell, is what counts.

Mr. Gardhouse gave reasons for the unsatisfactory condition in eastern Canada, and I may say the supply of beef cattle that is available for this year is very unsatisfactory. Judging by all the statistics that can be obtained, it is very, very small, and we are going to see famine prices in Canada before June or July; there is no question about that. Butchers' cattle are going to be 7 cents a pound and perhaps $7\frac{1}{2}$ cents and perhaps 8 cents a pound. The reason for that is the one Mr. Gardhouse dilated upon, the indifference of the farmer in not selecting his animals for carrying over; that is the principle of the constant examination of one's business.

Mr. Gardhouse's second point was that another reason for the scarcity was that breeders in Ontario and eastern Canada had concentrated their attention on one market which, for the time being happened to be their most profitable market. They shipped all their good bulls to the west and so depleted their own herds. A man must be constantly on the lookout for his best market, but he must not lose sight of the time when, if he keeps on cultivating that market, he will have no more bulls to sell.

The dairy industry has been a source of the greatest profit to Canada, but it is a fact, particularly in the district Mr. Gardhouse mentioned, that beef cattle have become a thing of the past. That is a mistake, and that mistake is being made by the cattle breeders of that district who concentrate their attention on dairying and forget that it is a profitable thing to raise beef cattle, and the result is that beef is being shipped into that district. Five years ago, there was not a carcass of beef shipped from Toronto to any point in that district. This year, two or three or four carloads are being shipped every week to towns in that district. Cattle breeders, I think, would do well in a meeting such as this to review the situation and to get statistics, and get a broad outline and understanding of the general trend of the business.

Here is a dairy section; there is a beef section. Here dairying is being abandoned and there beef-growing is being abandoned. Is it profitable that dairying should be abandoned or that beef should be abandoned? Can we not conduct these two departments together? On this point I cannot speak as well as Mr. Gardhouse, although the opinion I have has always been along the line of the solution suggested by Mr. Gardhouse, that a strain should be selected that would be profitable for dairying and for beef. That seems the most rational thing to do. It is certainly most uneconomical for a whole district to go absolutely out of the raising of beef cattle. There is no question that beef-raising is profitable, and must be profitable, and always will be profitable, so long as farming continues.

My remarks have been disconnected and disjointed and I apologize for not having them more carefully prepared. If each of us knew the problems of the other, there would be more sympathy and co-operation in the solution of these problems that we have to face.

DEVELOPMENT OF THE HOG INDUSTRY.

J. E. Brethour, Esq., Burford, Ontario.

I have been assigned a very large subject, as you will see by reference to the programme, and this subject can scarcely be thoroughly dealt with in the time allotted to me.

Like other important industries requiring skill in their organization and development, swine-rearing has undergone a marked change in Canada during the past two decades. In keeping with the march of progress in dairy farming, the raising of swine has made rapid advances. Stock-raising in Canada, as in all new countries, has followed rather than preceded the growing of grain as a marketable product. Even the early settlers raised a few hogs to supply themselves with meat and to provide a product acceptable to the local merchant in exchange for the needs of the household.

With the development of urban populations, and the growth of the lumbering industry, there grew up a demand for pork products. In the case of beef, the butcher very early became a necessary factor, while in the swine industry, the farm continued to combine the breeding and feeding operations with the slaughtering and curing of the meat. Then there arose a more or less extensive fresh pork trade, and most of us have a clear recollection of the loads of thick fat yearling pork that were hauled to market during the late fall and winter months. Size and fatness constituted the ideal in those days, and many an apology has had to be made for hogs sold under three hundred pounds by men who could not afford to feed them longer. Then farming was conducted as a comparatively simple industry without high expenses and independent of farm bookkeeping, and even yet there are those who argue in favour of the thick fat hog as a profitable proposition.

While the market for Canadian pork products was confined principally to a home demand, there was no incentive to change from the customs that had become well established, but so soon as we had an appreciable quantity for export, the requirements of the importing country had to be reckoned with. In the opinion of the producer a product may be ever so good, but unless its goodness is a kind that satisfies the ultimate purchaser, little hope need be entertained for the keen demand which is necessary to a high price.

It was, as it is to-day, the business of the farmer to raise the hogs, but to find a market depended on the commercial man who, in this case, was the pork-packer. Fortunately for the industry which expanded very rapidly, we had in Canada far-seeing and brilliant men engaged in the packing business, and while we may say what we will about these men, the development of the swine-raising industry depended more on the pioneers in pork-packing than upon any other agency. These men set a high value on the British market and had confidence in the ability of the Canadian farmer to produce the high quality of bacon and hams required for it. They then set about developing the right kind of hogs for the best trade, and what was done in the distribution of suitable breeding stock is an old story that need not be repeated.

The possibilities of the industry for Canadian agriculture appealed to our governments, perhaps, at the beginning, more especially to the legislature at Toronto, and those of us who were engaged in hog-raising will not soon forget the energy and effort put forth by the late president of this National Live Stock Association, the Hon. John Dryden, on behalf of the industry, nor of his superintendent of the farmers' institutes, Mr. F. W. Hodson, who conducted a most effective campaign on behalf of the bacon hog. Assisted by such able men as Prof. G. E. Day, of the Ontario Agricultural College, and others, by means of winter fairs and farmers' institute meetings, Ontario farmers were shown conclusively that the bacon hog was the most profitable to raise and the most readily sold in the best markets of the world.

The correctness of the teaching in those days is amply borne out by the report of the Swine Commission that visited Denmark and found that the Danish pig, from which the highest priced bacon in England is made, corresponds exactly with the pigs advocated for Canadian farmers and at the present time raised by them in every province.

The results of this campaign of education were very pronounced and promptly realized until within a few years the railroads leading to the large packing houses were loading hogs at almost every country station in Ontario once or oftener weekly with stock that came well up to the standard for the export trade.

Nor were the other provinces asleep in regard to the swine-breeding industry, as in each one of them excellent progress has been made, more especially in the matter of quality. In each and every province the 'bacon' hog is the standard, and the pigs that win the best awards at the maritime winter fair are of the same type, age and weight as those that take the ribbons in Ontario or in any of the western provinces.

Much credit must be given the excellent work accomplished by the Federal Department of Agriculture in uplifting the industry, more especially in the provinces outside of Ontario. Through the branch of the Live Stock Commissioner the teaching commenced in Ontario has been extended to all corners of the Dominion both at institute meetings and winter fairs, while these latter organizations have been induced to frame their prize lists so as to encourage only the bacon class of hog.

From small beginnings in the early nineties, the export bacon trade with Great Britain grew by rapid strides, until in 1905 Canada supplied Great Britain with about 20 per cent of her imported bacon. For three years this satisfactory level was maintained, but since 1907 a decline has been in operation until our supplies to the mother country have fallen much below what they were during those seasons of heavy export. The falling off, however, is not sufficient to cause any alarm, for we must consider the vastly increased number of mouths to be filled in our own country, while some of the rich agricultural provinces are not giving swine-raising the attention it deserves.

These facts are further brought out in figures, secured from the office of the Veterinary Director General in connection with the meat inspection service. In the inspected packing houses, there were killed in 1911, 1,239,748 hogs, as compared with 888,837 in 1910. This is an increase of 350,911 hogs, equal to almost 40 per cent. All provinces show increase except Manitoba and Nova Scotia, the former showing a decrease of 8½ per cent and Nova Scotia 3 per cent, while the increases were: for Ontario, 47 per cent; Quebec, 35 per cent; Alberta, 7 per cent, and Prince Edward Island, 64½ per cent. There are no inspected packing houses in Saskatchewan or British Columbia.

The slight increase of killings in Alberta in no sense meets the growing needs of the west, and this explains in large measure the failure of Canada to materially increase her export trade. Instead of shipping to the sea board as she did some years ago, her almost entire surplus of bacon, Ontario is now sending a constant stream of pig meats westward to feed the increasing population. The figures representing this trade are astonishing, for it is shown that of pork in one form or other, there were received at inspected establishments west of the Great Lakes from outside points in the month of December alone no less than 1,828,836 pounds, and this rate has been kept up for many months. These figures do not include importations made by other than inspected houses. This means that during the past year, there were consumed in western Canada something like 20,000,000 pounds of pork imported by inspected houses in addition to a large quantity distributed by other agencies. These figures should be of especial interest to the representatives from the west where there is so much feed grain and where agriculture is already suffering from the keeping of too little live stock.

The hogs of Canada have reached a standard of uniform excellence not surpassed by any other country in the world save, perhaps, Denmark. The short, thick hog of

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the 'corn belt' has passed away, and raisers of breeds, previously too short for the bacon trade, have been stretching out their pigs to meet the popular demand. In our efforts to satisfy the fastidious palates of the mother country, with a view to capturing as much as possible of her market, we have developed throughout Canada the lean, fine-grained 'Singer' that not only turns out a delicious carcass, but gives the utmost satisfaction to the breeder and feeder in the matters of reproduction and economical gains for food consumed. It is no doubt largely due to the quality of our bacon that the home demand is so difficult to meet, as shown by the imports and exports of five years ago as compared with those of last year. In 1908, Canada exported 95,945,099 pounds of pork products, while the same year we imported 16,274,414 pounds or, in other words, we exported that year five and three-quarter times as much as we imported. In the nine months of 1911, after April 1, which are the latest available figures, our exports were 48,446,675 pounds as against 13,165,786 pounds imported. These figures show that we exported $3\frac{1}{2}$ times as much as we imported. At this rate Canada will soon not be raising enough pork for her own requirements.

The development of an 'All Canadian' bacon hog, or an 'All Bacon' Canadian hog is strikingly reflected in our pedigree registration. During the past eleven years hogs of certain breeds have increased by leaps and bounds, others have more than held their own, while others again that showed signs of life some years ago, have passed off the stage so far as registration in Canada is concerned. The following table shows the numbers of pedigrees of each of the several breeds that had been recorded up to 1900, the number of each recorded up to the end of 1911, and the number of each recorded since the beginning of the present century:—

PEDIGREE REGISTRATIONS.

	Up to 1900.	Up to 1912.	No. since 1900.
Berkshire.....	12,147	23,345	11,198
Yorkshires.....	6,681	39,379	32,698
Tamworths.....	2,398	8,873	6,475
Chester White.....	2,519	9,104	6,585
Duroc Jersey.....	706	1,338	632
Poland Chinas.....	2,595	3,116	521
Essex.....	20	272	252
Hampshire.....		455	455

Suffolks and Victorias are no longer recorded.

This table shows that breeds recognized as best suited for the production of hogs of the bacon type have increased at a much more rapid rate in recent years than some other breeds which hold prominent positions in the United States. Nor do the numbers shown in the table tell the whole story, for we know that breeders of all the breeds have been aiming at the bacon type. To such an extent has this been the case that the most popular Berkshires and Chester Whites now found in Canada differ widely from the ideals set for these breeds in the countries of their origin. It is also shown that certain breeds of the thick type have practically ceased to be patronized by the farmers of Canada.

In the use of pure-bred sires to head breeding herds, swine hold a position perhaps in advance of other classes of live stock. The rate at which swine increase renders this possible. Unfortunately, however, all recordable hogs are not ideal by any means—a fact which far too many of our swine raisers fail to recognize. Even the breeders of pure-bred herds do not fully appreciate this truth, so that we find far too many inferior sires employed throughout the country. If the influence of the sire were more correctly appreciated, we would be able to claim not only an all-bacon

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Canadian hog, but an all Canadian bacon hog that would still further increase our trade both at home and abroad and improve our position as farmers by the increased profits of our industry.

The continued prosperity of the swine industry cannot be maintained by the efforts of the farmers themselves. As the industry in its early days required and received the substantial support of the packers of that time, it still requires, on their part, active co-operation. Unfortunately, systems of buying have been allowed to creep in by the packers that do not tend to encourage the production of the higher class of hog. Nor do the methods pursued by the packers tend to stimulate production. While packers, like other business men, cannot be expected to conduct their business at a loss, it would seem to be wise on their part not to take advantage of liberal supplies to make an undue profit, a policy which cannot but result in discouraging hog-raisers who would like to continue in the industry but find it unprofitable to do so; such a policy creates a condition that is unprofitable to the producer as well as a hardship to the consumer, to say nothing of the partial idleness it at times brings about in the packing industry. Undoubtedly the pioneer packers in this country as well as in England showed a generous spirit towards the industry. The packers of the present day, however, have sought only their immediate interests, and in looking out for these have undoubtedly underestimated the intelligence of the Canadian farmer.

Discussion on the Development of Hog Industry. Led by E. C. Fox, Assistant General Manager, Wm. Davies Co., Ltd., Toronto.

Mr. Brethour's paper on the development of the hog industry has naturally dealt chiefly with its development in relation to the breeding and raising of stock. I will endeavour to supplement that view point by dealing with its development in so far as breeder, raiser and packer are mutually concerned. Perhaps with these two view points before us, we will be able to secure a better co-ordination of interests, in which I believe there is room for improvement.

I hope you will not be disappointed. I am not going to defend or apologize for the packers. Here you are—here we are—both legitimate industries, with large and intricate problems to solve. Some of these problems and questions are more or less mutual, and if this discussion brings us to a better understanding of some of them, it will have served its purpose.

In the development of the hog industry, perhaps the most important common problem is the character of hog to be raised. Our one ultimate purpose is to market our product to the best advantage over foreign competitors. The question of cure of meats is wholly a packer's problem, and need not be dealt with here except to say that the packer who neglects his cure neglects a vital part of his business, and helps in a general way to discredit the industry by giving people a dislike for hams and bacon, and indirectly affects the live hog industry.

There are three phases in connection with the character of hog to be raised which are of common moment to us, and which I would like to discuss very briefly. First—the intrinsic quality of the meat from the live hog. Second—physical form, or the percentage of various cuts to the whole carcass: for example, the proportion of the head, ham, shoulder, etc., to the live hog. Third—the total percentage of meat (that is ham, back, belly and shoulder) and lard to the weight of the live hog.

First: The intrinsic quality of the meat from the live hog.—No matter how ideal your hog may be from the standpoint of physical form, care must be taken in breeding that your hogs will make into meats possessing intrinsic merit, apart altogether from cure. By reason of governmental co-operation in Denmark, this point is well taken care of in that country, with the result that Danish hogs have the double merit of good physical form, and the intrinsic qualities of good, fine-grained meat, a well-streaked belly, and a back containing no fat in it or through it, except on the

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back portion itself, and this layer of fat is uniformly even. Speaking generally, if these features were overlooked in hog-raising in this country, the hog industry would receive a set-back from which it would take it years to recover. I am well aware that there are certain portions of the country where we receive hogs with heavy, fat flanks and backs, and the back pierced by a continuous streak of fat through it. I am well aware that the owner of such hogs sometimes receives the same price as does the owner of the type presenting the better bacon qualities. We will deal with this question under another heading. Failure to recognize the above particular points in breeding would speedily result in the complete destruction of an important export business, and our western Canadian buyers would cease to give product from Canadian hogs any preference over American meats, as far as quality is concerned.

Second: Physical form, or the percentage of various cuts to the whole carcass.—This is where the bacon hog, about which we hear so much, should be discussed. I would define the bacon hog as a hog which, in addition to possessing intrinsic qualities mentioned above, has a build which gives a maximum yield of the valuable cuts and a minimum yield of the less valuable cuts; hence a long side is desirable, not, of course, unduly elongated to become too thin, and a small shoulder and head. Lack of recognition of these features in breeding is a source of loss to the breeder, the farmer and the packer. To permit a majority of hogs to possess a large head, neck and shoulder would bring less money for the hog in finished products, and the immediate result would be a lessened value for hogs for all concerned. Such a condition would, of course, take a long time in coming about, but to guard against it by seeking constantly to improve the bacon hog in these respects is as necessary to the permanent development of the hog industry as it is necessary to guard against hog cholera. Because of trade conditions and methods of buying, an odd farmer here and there throughout the country may play fast and loose by marketing hogs which are not carefully bred, on as favourable a basis as his neighbour, who has been more careful in his selection. This is the odd case, and we are dealing in the large. Let such cases become general, and the hog industry would suffer a severe and permanent monetary loss.

Third: The total percentage of meats and lard to the weight of the live hog.—This total percentage determines the packer's cost, apart from labour and other charges, and is, therefore, of vital importance to him. Our bacon hog yields in meat and lard from 61 to 68 per cent of the live weight in the packer's yards. This variation depends partly on seasons and climatic conditions, but chiefly on the character of the hog itself. Fat hogs are excellent yielders, both in meat and lard, which meat, of course, costs less per pound than meat from a bacon hog giving a 5 per cent less yield. The meat from such hogs is fat and unsuitable for the ordinary bacon trade. Its market is limited, and although at times the packer may pay as much per pound for the fat hog as for the bacon hog, yet his actual cost for product is greatly less by reason of a greater total yield. Because of the greater yield from fat hogs, and because also of a greater value for offal secured in the United States, the Americans are and always will be able to manufacture cheaper meat than can be done in Canada. At the same time the American farmer receives less per pound for his hogs than does the Canadian farmer. It is hardly necessary to say that the general introduction of the American type of hog would be ruinous to the hog industry, because the Canadian packer with the bacon hog serves a different class of trade than is served by the American packer. Canadian breeders are working along the right lines in these respects. Now there is a limit to the yield which we can secure from the bacon hog, without having heavy, fat product, which would very quickly swamp the market and destroy trade. I am not prepared to say whether that limit has yet been reached on a bacon hog weighing between 175 and 190 pounds. It may be by careful selection over a period of years that a type of bacon hog may be evolved which, without impairing intrinsic qualities or physical form, may give a meat and lard yield of 1 to 2 per cent more than at present. The direct monetary benefit of such result would accrue to the

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raiser of hogs, and would amount to a very large sum of money annually. An indirect benefit would come to the packer in a more firmly established hog industry.

All industry must either progress or recede. The interests of the breeder, raiser and packer of hogs are so inter-dependent, that the progress of one helps the others, and the decline of one section adversely affects all three. The breeder must constantly be on the alert to improve the breed, so as to produce a hog better adapted for the market, both in quality and yield. Failure in this respect results in a lowering of standard, which in turn affects the return to the breeder as well as to the farmer and packer. The packer, on the other hand, must be constantly watchful for as broad a market as possible, and for the best markets, in order to secure the highest returns. With the increase of scientific knowledge he must always seek to improve his cure, and to have the most modern methods of handling his by-products. Failure to be thus progressive results in ultimate loss of market, with consequent loss to the whole hog industry. Thus our interests are so interwoven that we have common problems to work out in the development of our businesses, one or two only of which I have endeavoured to touch upon.

In closing let me say a word in relation to the future of the hog industry. I feel safe in saying that no more British capital will come into Canada for the erection and operation of packing houses. British capitalists are going to Russia and Siberia, which two countries will soon be very important factors, indeed, in controlling the English bacon market. We are rapidly losing ground as exporters of bacon products, due to fewer hogs being raised than were raised a few years ago. True, Ontario has found a large customer in the west. This trade does not, however, offset the shrinkage in the volume of export trade of the last decade. We are at a crisis in the development of the hog industry. If we continue raising fewer and fewer hogs, just so quickly do we hand over a national and basic industry to foreign breeders, farmers and packers. In the coming years the demands of the export and Canadian markets will prove more than ample to ensure the permanency of a large and well regulated hog industry, producing weekly many thousands more hogs than we are turning out at the present time.

DAIRY CATTLE.

W. F. Stephen, Secretary Canadian Ayrshire Breeders Association, Huntingdon, Quebec.

We are half an hour behind our schedule time and we will have to get through as quickly as possible, and I will endeavour to make my remarks brief. I will merely give you some pointers so that you can draw your own conclusions from them.

Mr. Brethour referred to the swine industry as being a great one. The beef men have referred to the beef industry as one of the greatest in the country, and the horse men rightly claim they have a great business, but I believe we dairymen can claim that we have one of the greatest, if not the greatest, industry in the country which pertains to agriculture. It is for me to champion the dairy cow—God's greatest blessing to mankind!

The dairy cow fills a threefold purpose: She may be used as a beast of burden; she gives the finest and most delicate of food and then her carcass can be used for beef, but, of course, she does not give you the fine sirloin steaks or the splendid under cuts that you get from beef cattle. The dairy industry is important from three standpoints. In the first place because it is the true system of agriculture. It increases the soil fertilization and enriches the farmer and increases the population. It enriches the soil and the pocketbook of every farmer in the country. I need not dwell on the fact that it is a soil enricher; that is admitted on every hand. The breeding and raising of the dairy cow on the land gives the farm more soil fertilization and

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puts more on the farm than any other line of agriculture, and it gives us the greatest net return per acre, of course, apart from fruit farming and vegetable farming. Then it increases our population, because we manufacture the high-class products, milk and cream, into cheese and butter, and more labour is required to properly operate a dairy farm than to operate a beef farm or a grain farm or for the production of mutton and wool. Anything that brings labour into the country is an enricher of the country. Manufacturers talk at length about bringing people into our country to consume our products. The same thing may be said of the dairy industry. One of the greatest difficulties the dairyman is up against to-day is the labour problem. He has to compete with the manufacturer and others who take his labour away from him. There is a solution of this difficulty for the dairyman, and that is the bringing, from the old land, families from those places where dairying has been such a success. These men come to our dairies and make capable servants.

Figures are dry things in a convention of this kind, but I wish to draw your attention to the number of dairy cows in Canada in 1901 and compare that with the number in 1910. I endeavoured to get from the Census Commissioner, Mr. Blue, the returns of the dairy industry for 1911, but Mr. Blue informed me that these figures are not yet compiled, and I had to do the next best thing and take the statistics for 1910 which, of course, will not be quite as accurate as the census figures of last year. In 1901, the census returns gave us 2,292,120 dairy cows in Canada. Ontario led that with 1,000,000 and Quebec with 734,000. I find that in 1910, the total number of dairy cows in Canada was 2,905,982, an increase of 616,099. It may be interesting for you to know that Ontario made an increase of 22 per cent, Quebec 18 per cent, New Brunswick 16 per cent, Nova Scotia 17 per cent, Prince Edward Island made a decrease of 5 per cent, Manitoba made an increase of 26 per cent, Saskatchewan 160 per cent, Alberta 211 per cent and British Columbia 150 per cent. The three western provinces made the greatest increase, Alberta having the largest of all.

A few figures would not come amiss regarding the output of the dairy industry from 1900 to 1907, the last figures that have been available. The output of butter and cheese in Ontario was 15,000,000 and it increased to 17,250,000; Quebec in 1900 was 12,000,000 and it increased to 15,200,000; New Brunswick in 1900 was 245,695, increased to 377,800 in 1907; Nova Scotia 127,007 in 1900 and decreased to 71,113. Manitoba increased from 416,000 to 533,000; Saskatchewan increased from 30,230 to 38,500; Alberta increased from 126,400 to 387,000, and British Columbia increased from 105,600 to 1,426,700. In 1907, they had a drought in eastern Canada which hit the provinces of Nova Scotia and Prince Edward Island very severely, and I think that had something to do in decreasing their output during these years.

The total increase of our butter and cheese factories during these years was about \$5,000,000. The increase for the four years from 1907 to 1911 would be about \$4,000,000 as the output of our creameries and cheese factories. Added to this should be the amount of cream shipped to the United States during 1911, \$1,100,000, and also the amount of milk shipped to condenseries of one-half a million, making an increase of about \$10,100,000 during these four years. The total output of our factories would be about \$44,500,000.

I have said nothing about the amount of milk and cream consumed in our cities, which is becoming a large part of the dairy business in Canada. Milk is no longer a luxury, it is considered a food. It is difficult to get an estimate of the consumption, but Professor Ruddick makes an estimate that the amount of milk consumed in cities is nearly \$10 per capita. I think we are safe in putting it at \$9 per capita, giving us about \$45,000,000, or a total dairy output for the Dominion of \$100,000,000 per year. That is what we get from the good old cow. I am looking forward to there being at least three million milking cows in Canada when the next census returns are published. The average of our dairy cows taken in the census of 1901 was 3,200 pounds of milk. We find that that has increased comparatively little. I believe I would be safe in saying

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that the increase is not over 300 pounds, and I am looking forward to the next census revealing that the average output of the cows in Canada is about 3,500 pounds, and that is a comparatively small increase in ten years.

There is something wrong with our breeding operations in connection with the dairy industry, and I wish to point out a few of these errors. If we go to the Channel Isles or to Holland or Scotland, we find the very best of live stock, and we find that great care is taken in the breeding and raising of the young stock. They are not making such phenomenal records as are being made in the United States and Canada, but when we take their stock as a whole, we find there is greater vigour and prepotency and that they raise up their stock better than we do. Let me point out a few things that are not what they should be in Canada. In the first place there has been indiscriminate breeding from grade and scrub sires; then in the second place, breeding from young and immature sires, and in the third place mixing the breeds.

A few years ago, I had occasion to be at a gathering where there was a certain gentleman of rather peculiar appearance, and we got into a discussion as to what nationality he belonged to. Some thought he was Scotch, some English, and I took it upon myself to ask him what nationality he belonged to, and he said, 'Gentlemen, I was in a German settlement a few days ago and the same question was asked me and I answered in this way: 'One of my great grandmothers was Scotch, another Irish, another Dutch and another English. Now what do you call that?' One German held up his hand in horror and he said, 'Mein Gott, I call that hash.' That is what you have when you have all the breeds mixed together. Why men should still persist in mixing breeds, I cannot understand.

The fourth thing I want to point out is the failure to rear up the dairy calf. So many of our dairymen forget that the calf is the dairy cow and that it must be attended to. It must get the proper food to bring it on so that it will be a strong animal, so that when it comes to maturity it will be able to consume a large amount of fodder and give a large return in the milk pail. The fifth point is the failure of our dairymen to feed the dairy cow liberally. So many of our dairymen expect to make something out of nothing; a good deal like Pharoah wanting the Egyptians to make bricks without straw, we want the dairy cow to give back good returns on a straw diet and we cannot get it, but I am optimistic enough to believe that in the future, we shall have very much improved conditions in Canada. The signs of the times indicate that.

Let me point out to you a few of the signs of the times. In the first place, there is a greater demand for pure-bred sires; that shows that our dairymen are beginning to realize the value of our pure-bred sires. If you ask any of the dairymen who have herds of pure-bred Holsteins, Ayrshires, Guernseys or Jerseys, they will tell you there is a greater demand than ever before and that they are getting much higher prices. That is one indication that our dairymen are becoming alive to the fact that they must give up indiscriminate breeding and mixing of breeds. Another indication is the increased number of registrations in our pure-bred live stock associations. During 1911, the increase in the Holsteins, Ayrshires, Guernseys and Jerseys, and French-Canadian Association was 1,746—increased registration—and I consider that a good sign; 1,750 increased registrations for the past year in our dairy live stock associations; when you consider that that has been going on for four or five years.

Sometimes an agricultural machinery man goes to the farmer and he has to show him that he has a good machine before he will buy, and he has to show him that he will realize a profit by using that machine. The same thing applies to the dairy industry. The dairy associations must bring the value of their produce before the consumer. In other words, we must advertise. A good deal may be done by printers' ink. In doing this we are advertising the mediocre cow with the cow capable of doing much better than the average. The mediocre cow is being sent to the butcher. We are pleased to know that our government is giving the dairy industry some assistance.

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In the first place, they are doing much for the owners by introducing a system of cow testing. There is no better way of proving the worth of the dairy cow than by weighing the milk and testing with a Babcock tester, and by means of testing his cows, the farmer can get rid of the robber cow.

In 1906, the Honourable ex-Minister of Agriculture, Sydney Fisher, organized cow testing associations at Cowansville, and before 1906 was closed eighteen cow testing associations were established, with 266 members and over 3,000 cows. In 1911, 188 associations were in existence, with 1,200 members and 11,000 cows. Denmark has been held up to us as an example in that respect. Conditions here are different from those in Denmark. Denmark is a small country where dairying is the principle line of agriculture and where the farmers are close together. Here they are more widely apart, and these dairy associations cannot be operated as successfully, but we are getting to a point where we will be able to operate them successfully.

The government have now established dairy centres. These have been established during the last year, and this year they will have ten or twelve dairy centres with a man in charge of each. The average production of the herds in these centres has been increased all the way from 500 to 2,000 pounds. There are individual herds that have been increased, some 50 per cent and 45 per cent and 100 per cent, and 150 per cent is not uncommon, and some have even gone as high as 300 per cent. For the pure-bred herds, we have a Record of Performance test that was established five years ago, and to-day we have 2,308 cows and heifers entered in that test; 1,800 of these have been entered during the past eighteen months, and already there have been over 400 cows and heifers qualified in that test during the past year.

What will be the outcome of all this and what shall be our work for the future? We must not, as dairymen, depend too much on governmental assistance. We must do something for ourselves, and the owners of pure-bred herds must improve them and cut out the ordinary animals so that they will not have a single cow in the herd that does not come up to the standard. Some people say they do not like to have a standard, but I think there is something in the old Chinese proverb, 'Aim at the sun, and although your arrow may not reach it, yet it will fly higher than if you aimed at anything on a level with yourself.' We must have a high standard and aim to get it.

In stock-judging classes, we are teaching our young men to judge the best kind of dairy cows. There is something better than that, and that is the scale and the bottle, etc., right in the barn. Greater attention must be paid to rearing the calves, and the practice which Dr. Tolmie referred to yesterday of slaughtering the heifer calves where they are sending milk to the cities should be condemned. I say it is almost a sin to slaughter a good dairy calf with a good line of ancestors behind it. Rear up the calf and make your herds better. I thank you, gentlemen, for your kind attention.

Discussion led by Mr. R. S. Stevenson, Ancaster, Ontario.

I am sorry the time is so short, because this dairy business is one of the most important in the country in connection with agriculture. I will just give you a few remarks in the short time I have at my disposal.

The possibilities of the dairy industry in this country are almost unlimited. We are practically only on the edge of dairying. There never was, in the period of our existence, a time when it was better to go into dairying than right now. I do not wish to antagonize the dairy business and the beef business, because we must have beef in this country, but to hear Mr. Gardhouse and some of the other gentlemen say that we are not producing nearly enough beef cattle to supply even our own country is a condition of things that is wrong. When you come to look at the two industries from the financial point of view, there is no question in my mind that the dairy industry is the more profitable. There is one factor in the keeping of beef cattle that we do not have in the dairy business, and that is that the feeding of beef cattle is

largely a speculative business. A man goes out in the fall, as I have done myself, and buys up a bunch of steers to feed during the winter and he does not know what he is going to get for these cattle in May or June.

There is a steadiness about the dairy business that is very attractive, and it is a business that is well adapted to the average farmer. The profit on a beef steer is not very large. I think one gentleman said yesterday he made \$17 in Alberta. I think \$15 is a fair profit. As I said before, I do not want to antagonize the two businesses because we must have them both, but if conditions will allow you to go into the dairy business, there is no question there is a larger and safer return.

Are we getting out of this dairy business the profit and returns it is capable of giving us? I contend that we are not. I do not think we are getting half as much as we are able to get out of it, and that is largely to be attributed to the fact that we have got too many unprofitable cows. In the province of Ontario—and I do not think the other provinces are any better—we find that the average production is about 3,500 pounds of milk per cow, and the cow that gives that amount will barely pay for her board if the milk is manufactured into butter and you only get 25 cents a pound for it. It would only bring you in about \$35 or \$40, and I have never been able to feed a dairy cow for less than \$35. These 3,500 pound cows must be got rid of. Until a man fixes a high standard for his cows, he will never make the success of the business that he should. Suppose we raise the standard of our cows to 6,000 pounds. The output would be doubled, not by keeping more cows, but simply by keeping better cows. We have too many of these robber cows. Our stables are full of them. I like to go into the barn and see the kind of stock a man keeps. Sometimes I find modern stables fitted up with all the latest devices, well ventilated, and everything for the comfort of the cattle, but as I pass along and look at the kind of cattle in them, I often find fifteen or twenty cows with only six or seven that could possibly be profitable to keep. You find the same thing on some farms where they are feeding beef cattle. You will see a bunch of steers, the majority of which would never make any profit for the farmer. We cannot afford to keep these unprofitable animals in these valuable stalls. You can better have a house with a tenant in it who did not pay rent than to have unprofitable cows or steers occupying stalls in your stable, because you do not have to board the non-paying tenant but you have to board the cow or steer that stands in your stall. We must look at these things in a business-like way. We must apply business principles to our farming operations, and I look upon the feeding of live stock as nothing more than a manufacturing business. The manufacturer is always looking for something that will enable him to manufacture his products at a cheaper rate, and if a machine comes out that will enable him to manufacture at slightly reduced cost, he must have that machine. If he does not the other fellow will get it and will be able to undersell him in the market. The feeding of live stock is just as much manufacturing as the making of boots and shoes, and in order to cheapen the cost, we must keep high-class dairy cows or steers, if we are feeding for beef, and we must grow cheap fodder on the farms in the shape of clover, hay, alfalfa and ensilage. It is just as necessary for the farmer to try in every way to reduce the cost of production as it is for the manufacturer, and some of the reasons why we are not getting the profit we should out of the dairy business is that we are not improving our methods, and in the kind of cows we keep.

The first thing we want to do is to weed out the unprofitable cow and then fix on the type of animal that we want and breed towards that type all the time, and by doing that we will accomplish something. If we persist in indiscriminate breeding, crossing backwards and forwards, we will never make a success. There is no man who has ever persisted in that line of breeding that has ever got good results, and it is this cross-breeding of all kinds of live stock, horses, cattle and everything else that is the curse of the live stock industry of this country. We have got to get away from it, and we must fix a good type in our minds and then breed towards that type. I

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am not here to advocate any particular breed of cattle. Surely you can get one that will suit your requirements. We have four good breeds of beef cattle and four good breeds of dairy cattle, and after you have chosen your particular breed, stay with it. If you start to grade up by using the Ayrshire, keep on using the Ayrshire and you will accomplish something, and if you start in with the Holstein, keep on with the Holstein, but if you will persist in going backwards and forwards and changing from one breed to the other, then you are making a great mistake. These breeds have been developed for hundreds of years by men who probably forgot more about breeding than either you or I ever knew. It is a folly for any farmer, in his short life time, to think that he can go to work and improve on these breeds by cross-breeding.

You cannot tell very much from looking at the outside of a dairy cow. Her capacities are controlled very largely from the inside. There is no man who can go among a bunch of bulls and pick out one solely from his appearance. He might do it but it would be very largely a matter of chance, and the best way is to look at the record of his dam. There is a prejudice among farmers against an old bull because they think he will be cross. It is not necessary for a bull to be cross simply because he is old. As far as I am concerned, I think all bulls are cross, and if you follow it up you will find that it is the quiet fellow that does the damage. No bull should be led out without a staff attached to the ring on his nose. It is through carelessness that accidents occur. Never trust any bull. In an old bull you have the advantage of knowing the kind of stock you will get.

I do not believe the live stock of this country are as good and vigorous and strong in constitution as they were twenty-five years ago, and I think it is very largely due to the fact that the breeders have not been using old stock. When a farmer goes to buy a bull, he will invariably buy one two years old. I think we can very well take a leaf out of nature's book. There is no domestic animal we have ever had that has done more for the farmers of Ontario than the old dairy cow, and there is no other animal that you can give an extra feed of grain to one day and she will give it back to you in the pail the next. Take away the dairy cow and you take more away from your table than you do by taking away any other animal on your farm. What would our tables be without butter and cheese and milk and cream. There is no animal that has done more for the country than the good old dairy cow.

Something was said by Mr. Gardhouse about the general purpose cow. The general purpose cow is all right if you can get her, but the great difficulty in this country is how are you going to breed her with any degree of certainty. Suppose you have a good general purpose cow, where are you going to get a bull to mate with her that will probably be just as good as she is. That is the difficulty you are up against. I think it would be better to put beef on one side, and go in for the dairy cow. We hear a great deal about tuberculosis, and Dr. Rutherford gave us a splendid talk on that subject last night. That is a matter that we have got to look out for, and I know that he is perfectly right in what he says, and there is a great deal more of it in this country than any person thinks.

I would like to say a little about tests. I would not advise you to buy a bull from a cow that has only made a one week's test. I am not here to speak against the week test, because it is very valuable as far as it goes, but we must have a longer test. It is the persistent milker that we need in our business; that is the cow that is giving from six to eight or twelve thousand pounds of milk in the year. It is not the cow that comes in with a great flow of milk and is dry in three months that we want for the dairy business. We want, as I said before, the persistent milker. I would like to talk longer about this question, but I see you are getting impatient and I thank you for having given me such a kind hearing.

FIFTH SESSION.

THE DEVELOPMENT OF THE SHEEP INDUSTRY IN CANADA.

John Campbell, Woodville, Ont.

This line of husbandry is one which has been losing ground in Canada during a number of years past, as shown by the decrease, according to available statistics. It is admitted by a very large majority of agriculturists that a flock on the farm is both useful and profitable, in more ways than one. Directly, as producing more income, according to capital invested and the labour required, sheep are held in high favour by those who know of their good qualities. Indirectly, the flock is in favour, because of its place as a weed-destroyer, and of its ability to gather a large portion of its living from grass growing in nooks and corners which would otherwise be wasted.

How would we fare without wool for our clothing, and the best of meats—lamb—for our tables?

And yet, with such convincing facts constantly before us, sheep-breeding for the common markets has been gradually declining. We may well carefully consider what shall be the ultimate results if the discarding of flocks be continued, and what the rewards, if any, of making the raising of lambs for the market part of the business on every well-regulated farm.

According to the old saying, 'to know a fault is half the cure,' but there is another proverb equally true, which is 'that none are so blind as those who will not see.' The question to be discussed now is how can this industry be more fully developed? According to hearsay, some of the hindrances in the way are dogs, coyotes, want of proper fencing, and the old-time dangerous cry, 'they are hard on grass.'

Is it not humiliating for man to allow dogs drive him out, or keep him out, of a pleasing and profitable business. Need it be so when a five dollar bill and a few hours' time will provide a moveable enclosure, where the flock may be safe-guarded at night in the pasture field and the owner rest unconcerned from dark till daylight.

Coyotes are disappearing and will soon be forgotten. In the western provinces, wires, strung on posts, kept horses and cattle in bounds, but, as a means to restrain sheep, they were useless. That hindrance to sheep husbandry is being removed as the woven wire fence is coming more and more into use. The determination to make sheep-proof fences, was heard frequently expressed at the winter fair in Brandon, Man., in 1910. Meeting at Toronto recently with several whose acquaintanceship was formed at Brandon Fair, it was pleasing to learn that flocks of sheep have been lately added to their farm equipments.

In dealing with the dairymen's contention, regarding their dislike to sheep, it is safe to surmise that it is treading on thin ice. But we must take facts as reported on good authority.

That the average dairy cow does not pay for its keep has been, and still is, a standard saying at conventions, institute meetings and such like. It was heard at a meeting two weeks ago, when stated in another form by a gentleman who has a very excellent and highly profitable stable of dairy cattle. The inference must be that dairying, as a whole, is not by any means so profitable a line of business as we are asked often to believe. The average is merely a summing up of the whole, and if the average is below a profitable standard, the whole must be on a similar level.

Travelling on a train last month with one of our Dominion Government's cost-testing officials, he gave us the information that he found dairy cows costing \$41 annually for maintainance, producing not more than 3,000 pounds of milk during the

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same period. It so happens that this month, for the first time in our country's history, we are able to get official figures regarding the cost and returns from small flocks of grade ewes at widely separated points in Ontario where nine illustration flocks have been under test by the Ontario Department of Agriculture. The nine flocks' cost for maintenance during the year was \$798.14. The total receipts, consisting of wool and finished market lambs, amounted to \$1,167.53, furnishing a balance of profit of \$369.39, or 46 per cent of cost as the share of profit. The profit on capital invested was 40 per cent. The best-doing flock gave on investment 71 per cent; the lowest in profit flock gave 9½ per cent, and one flock which was unfortunate in having a loss of two ewes and the ram 'at head of flock'—values of losses deducted—still made a clear profit on investment of 17¾ per cent.

It may be stated that the year was not nearly so favourable in prices realized for the finished lambs as any of several former years would have been. It was not up to the average.

It is strange, but to a very marked extent true, that if any statement is repeated often enough, he who utters it, and they who listen, believe it to be true, though in reality it is far from being correct.

On the other hand let us notice how any new or old line of production, which people use and are the better for using, finds its place and market. It is not sufficient to have, for the public, the superior article produced. We must let the public know that we have such within their reach and use every lawful endeavour to convince the people that they can have more healthful and comfortable and, therefore, happier living by using the commodity we wish to promote.

To a large extent, the way is already paved to the profitable markets for our flock's productions. The failure and blame rest greatly with the Canadian producer in the case under consideration.

The demand from east to west, but especially in Ontario, is increasing more rapidly than the supply. It is not creditable to us that we have not supplied our own people during the past three or four years with all the mutton and lamb required for home consumption. To develop the industry and so stimulate it as to meet the demand fully, we must make known, and that in a convincing manner, the profits directly and indirectly which are nearly absolutely certain to result from the flock on the ordinary farm, cared for in a reasonable manner and given but a small share of the attention required in other lines of live stock husbandry. It may be necessary, in order to convince the many, to spend considerable in the way of educating the indifferent, as to the possibilities of the industry. Our Ontario department spent freely in promoting the bacon hog industry with, on the whole, very gratifying results. It spends annually in promoting the dairy industry no less a sum than \$100,000, with results as already stated. It is high time for our governments, federal and provincial, to aid liberally, in some way, the production of meats from our flocks, and also our herds, if our workers—the makers of our great country—are to have their just share of table necessities.

We need more and better flocks. People generally stand ready to be so convinced if not yet fully aware of existing conditions. We must be ever ready to talk sheep up and not down. Tell the good story of the great benefit and possible success of the flock on the farm. Then repeat and repeat and repeat the truths, until the ones who should know cannot help knowing the good which may be got with such comparative ease and with so small an outlay. This is an age of advertising. Our agricultural departments must be held responsible for any lack on their part to spread truths of which they are cognizant, truths which, if made widely and freely known, cannot fail in benefiting the country at large.

Our Dominion Department of Agriculture, with the able leadership of Dr. Rutherford, our Live Stock Commissioner, has been active in recent years along the lines of interprovincial trading and also in appointing a commission to investigate

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conditions in favour of, and those hindering, development. Such efforts, if followed by a spreading abroad of the knowledge gained, will surely result in turning the attention of the general farmer to that which is in his favour.

That we have in Canada, and especially in Ontario, all the requirements necessary to make sheep-breeding equally or more successful than is possible in other lands, has been clearly demonstrated by the owners of pure-bred flocks, who have again and again led with their flock's productions at world's fairs and international exhibitions.

So prominent are such successes in the minds of our American friends to the south, that some of their agricultural college professors and students are making a special study of individual flocks in Ontario at the present time.

Having such indisputable facts to reason from, there is no need for delay in putting forth all possible legitimate efforts in compelling the farming public to give due consideration to an industry which is certain to have a beneficial and comforting bearing on their personal and financial welfare.

That compelling, which will surely develop the business, can only be done somewhat in the manner of successful departmental stores. They advertise freely. We have had it proved to us without doubt, that the best of quality can be produced in our Dominion. We have the consumers who are prepared to use more, considerably more, than we are now producing, and that at a highly profitable price to the breeders. The endeavour then should be, and must be, to enlist the energies of our agriculturists to find a place on practically every farm for a profitable flock of sheep.

SHEEP IN CANADA—1907 TO 1911.

—	1911.	1910.	1909.	1908.	1907.
Prince Edward Island.....	108,600	110,599	109,244	113,206	110,936
Nova Scotia.....	351,000	358,263	361,444	373,392	384,940
New Brunswick.....	190,800	203,620	215,289	230,502	250,546
Quebec.....	533,400	549,068	570,342	600,992	626,033
Ontario.....	975,400	1,032,227	1,118,945	1,205,630	1,106,183
Manitoba.....	29,600	30,266	29,074	29,265	.....
Saskatchewan.....	111,300	185,360	129,630	116,438	.....
Alberta.....	179,200	179,067	171,422	161,979	.....
British Columbia.....	.....	.....	.....	.....	.....
Canada.....	2,889,300	2,598,470	2,705,390	2,831,404	.....

DISCUSSION OF SHEEP INDUSTRY.

Led by W. T. Ritch, Department of Agriculture, Ottawa.

It is only an hour since I heard that Mr. Dryden was not likely to be here, and some of the points that Mr. Campbell referred to are those to which Mr. Dryden gave special attention, and I am sure he would have had something interesting to tell you.

Mr. Campbell referred to our report and I am very pleased to know that it has been favourably received. Some people make the great mistake of looking at what a report says about their own province and not paying any attention to the rest of it, and I hope you will not do that in this report. There is much in it that will be of interest to every province, and there is considerable information in it that may be new to you and something that you may possibly turn to account. If you are disappointed with the sheep industry in your own province, do not throw the report away, but go over it carefully and I am sure you will profit by doing so.

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According to what Mr. Campbell says, one of the chief excuses for not going into sheep is the dog question. I regret that we did not give the dairying side of the sheep industry special attention. In Great Britain a number of sheep are kept on dairy farms, and I know they are kept on dairy farms in other countries and I know that they pay. If business leads me to visit the old country this summer, I intend to look into that question thoroughly. It is a mistake to think that one of the chief reasons that sheep have been a failure in this country is because of dogs. Some people have an idea that sheep require no attention, but they never made a greater mistake. They require attention just as much as any other kind of live stock, and wherever we find sheep getting as much attention as other live stock, we have always found that these farmers are the most intelligent and the most successful. I never yet found a successful sheep man who was a poor farmer. Whenever you see a man who is successful with sheep, look at his buildings and see how tidy they are, and his fence corners and how clear they are of weeds, and his crops generally, how well they look. Sheep require less capital and less labour than other live stock. A great complaint in the eastern part of Canada is that the young people leave the farm and only the old people are left. That is one of the chief reasons why sheep-raising should be more popular. A man may be getting old and infirm and the young people may have left him, and he may not be able to go into the stable and look after the horses and steers, but he must be very old and very infirm if he cannot look after a few harmless sheep, and considering the amount of labour necessary, he is more independent of hired help than in any other line of live stock.

Another excuse that is made for the decline in sheep-raising is the low price of wool. Wool should not have the first consideration in the raising of mutton sheep, but if you are raising merinos, then wool must have the first consideration. The wool of a mutton sheep is only worth \$2 or \$2.50 under the best market conditions, and it is a very poor sheep that is not worth \$5 or \$6. If you look into the figures carefully, you will find that sheep will pay you better in proportion to the capital invested than any other branch of live stock, even if you grow no wool at all. You must not expect to get the high price for the wool of mutton sheep that you were accustomed to get twenty years ago. A new kind of wool has taken the place of the old kind; fashions have changed; the price of manufacturing wool has changed. Twenty years ago, we heard very little about freezing mutton and there was very little thought of the lamb trade, but to-day the lamb trade is an important one and the frozen mutton trade is enormous.

The production of frozen mutton means cross-breeding, and the production of the cross-bred wool completely revolutionized everything, and it has continued to hold the first place in the market. We are not going to be satisfied with the prices we are getting for wool. It ought to be 40 per cent more than we are getting, and I hope that in a very few years we will get what we should. The price of mutton has steadily increased every year and the number of sheep has steadily declined. The Maritime Provinces not only have a local trade, but they have an export trade with the New England States, which is their chief market. In 1905, the price of mutton was from 2 cents to 2½ cents a pound live weight, and Prince Edward Island, at that time, had 125,364 sheep. In 1907, the price was 4½ cents to 5 cents a pound live weight; in 1909, 4½ cents to 5¼ cents; in 1910, 5 cents to 5½ cents, and the sheep population in 1909 was only 79,470, and in 1910, 75,100; the number of sheep less than half and the price of mutton more than double. The other Maritime Provinces tell the same tale as Prince Edward Island.

I should like to hear a discussion on the growing of feed for sheep during the winter months and the best way to feed them. That is a subject that should be taken up in the Maritime Provinces. Neglecting to dip is another serious thing. With the exception of a few breeders of pure-bred sheep, dipping is neglected, and it is impossible to compete with other countries in wool if we neglect dipping, because

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they find it absolutely necessary to dip twice a year and we will have to do the same. I hope some scheme will be devised whereby the small farmer with a small flock will be able to dip conveniently and satisfactorily by having some system of co-operation. Nine or ten small farmers who live close together could invest in one first-class dipping outfit and drive their sheep every season to that particular farm where the dipping plant was located, and they could pay the farmer 2 cents or 3 cents per sheep for the trouble of looking after the dipping. That system has been found very satisfactory in certain districts in Scotland and Wales and Ireland. The difficulty of washing sheep before shearing is well known in Canada. The streams are cold at the time the sheep are shorn, and if there were a large dipping tank filled with water and soda and some soft soap, and a few pails of hot water to take off the chill, that difficulty would be overcome.

We have not got to the stage of cross-breeding in Canada yet. The cross-breeding that has been done has not been very good. There is no scientific system. I hope to be in the west next month and go into the ranch question. The price of the different breeds of sheep is a big question to go into but is a very important one. We should try to have each district confine itself to one particular breed of sheep. Suggestions have come from the Maritime Provinces during the last fortnight of a very feasible plan which I hope to bring to the attention of the Live Stock Commissioner this week, and I hope that by October it will be decided which breed is most suitable for the district so as to have one breed in each locality. Three years from now, I hope we will have all one type in certain districts.

Professor GRISDALE.—I have listened with a great deal of interest to Mr. Campbell and to Mr. Ritch on this sheep question. Mr. Campbell made reference to the lack of work on the part of the government to help this industry, and in some measure he is correct in saying that there has not been sufficient attention given to this matter by both the Dominion and Provincial governments. We are trying to do something to help this industry on our experimental farms. I have been interested in the sheep-breeding industry in Canada for a number of years, and it always seemed to me that one of the principle drawbacks to the sheep industry was the low price which many of our farmers are compelled to take for the lambs in the fall when the great majority of the lambs are put on the market. It is a surprise to me that more farmers do not carry them over.

Three years ago we undertook some experimental work at Ottawa in feeding lambs in three ways—one group on roots, one on corn ensilage and the other on a mixture of corn ensilage and roots. The results were satisfactory and showed considerably over a dollar a head profit after paying for all the feed and care, and paying the highest market price in the fall for our lambs. We did the same thing last year with equally satisfactory results, and we are doing it again this year.

I have decided to undertake experiments similar to this on various other farms, and we have under experiment at Lethbridge, in Alberta, 250 lambs which we are feeding in four or five different ways. We have about 100 at Indian Head, and over 100 at Brandon, and a number at Agassiz, and a number at Nappan, and thirty on the island. We are trying to find out the cheapest way of feeding them and the foods best suited for lambs. It seems to me that it would pay the sheep breeders to bend their energies in the direction of extending our markets for lambs and not confine themselves to the months of August, September, November and December. It is difficult to get lambs, especially in this part of the country, ready for the Easter market, and it is also difficult to get them ready for the June market, but I think we could extend the market, and if we can, it will give a great impetus to this sheep-breeding industry.

We had no difficulty in keeping our sheep through the winter, and they ate up a lot of feed that, in many cases, would hardly have been consumed by other stock, and certainly would not have been consumed by any other class to greater advantage, not even by the dairy cow.

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We are doing all we can at the experimental farm and we hope to increase our flocks. I believe sheep will be one of the chief factors in clearing up the weeds which pollute many of our western farms. The sheep industry is bound to take a prominent place in the west, and we are doing all we can on three of the farms there to help them along.

Dr. RUTHERFORD.—I have listened with a great deal of interest to the discussion on the sheep industry, and I would like to express my very deep sense of the tremendous importance of the agriculture of Canada of a speedy and comprehensive development in every province of the sheep industry. There is no question at all that sheep can do more in the way of preserving and restoring the fertility in the soil than any other of the varieties of our domestic animals. At a minimum cost, great profits can be secured from the keeping of sheep, and there is no province in the Dominion that has anything like the number of sheep which it ought to maintain. I think the country owes a debt of gratitude to Messrs. Dryden and Ritch for the excellent report they have made on the sheep industry.

I studied for a good many years endeavouring to stimulate a public interest in the sheep industry, and I finally found that a good deal of the hesitation and of the disinclination of the people to go in for sheep was due largely to the misunderstanding of the wool side of the question. Read the report.

You cannot study it and understand it and digest it in a day or in a couple of days, but if you will study the report you will begin to see light on the question, particularly on the wool side of the sheep question.

I have hung up a little picture above this dairy cow—you will notice I did not put it below. It is the picture of the 'wether' of Mr. Lloyd Jones to which allusion was made. That 'wether' was champion at Chicago and is occupying a position of prominence in the picture gallery of this convention.

MARKET FOR CANADIAN HORSES.

Herbert Smith, Esq., Union Stock Yards, Toronto, Ontario.

I have been invited by the Executive Committee to make a few remarks on the 'Market for Canadian Horses.' I might answer this question in a very few words by stating that our market will be in the Dominion of Canada for the next twenty years. Now, gentlemen, there is no religion or politics in what I am going to say, and should I say anything that does not agree with your opinions, don't take it to heart, for we are all here in the same interests and for the sole purpose of trying to make some suggestions that will improve the agricultural conditions of this great Dominion of ours. There have been a number of statements given, and I think I am quite in order when I make the statement that there is no place in this country where a man has a better opportunity of learning the requirements of the horse market than on the floor of a horse sale ring, where one is continually meeting people from all quarters of the globe. Therefore, from my experience, I am going to tell you what I think is wanted to improve the horse industry and what the general trade wants. First, I would like to go back a few years and tell you that I have seen numbers of American buyers right on our market buying and shipping load after load of choice stock across the border. I have seen English buyers come here and buy from one to five and six carloads of the very finest coach horses suitable to be shipped to European markets and bring the highest prices for all kinds of work, busses, trammers, job work, coaching or saddlers. Where are the stallions and mares that bred this stock now? I tell you, gentlemen, they are practically extinct in this country to-day. These were clean boned horses of the carriage and saddle type, standing from fifteen two to sixteen hands and were sold from \$185 to \$225 per head, and I venture to say

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it would be next to impossible to pick up one carload in Ontario to-day even at a much higher price. Speaking of saddle horses, we have heard a lot about the breeding of horses and the placing of stallions for remounts for the army. This is a move in the right direction, for we must protect our country, but it is a matter for the government to figure out on their own account.

Now, if not out of order, I have a few suggestions I would like to give for your consideration in regard to army remounts. I know, and you all know, that the price offered to-day for good saddlers suitable for army purposes is so far below the cost of production that breeders of light horses will not take a chance. With our wonderful climatic conditions and limestone formations in Ontario, which have a tendency to give horses the very finest quality of bone and sinew, this is the province to breed army remounts in, and I might also add that it is freer of contagious diseases than any other country—thanks to our Veterinary Director General. I am going to suggest that the Dominion government make a beginning at once by securing, say, one thousand of acres of land and start a remount depot. In connection with this—and here is where the Department of Agriculture may do something practical in addition to what has been done, I would suggest that a schedule be established, by the government, of prices which they would agree to pay for suitably bred horses for military purposes at any age, say \$85 for yearlings, \$100 for two year olds, \$135 for three year olds, \$170 for four year olds and the top price for five year olds, all subject to inspection. These could be purchased in all parts of the province and shipped to headquarters, where they could be trained and conditioned for service. The benefits to be derived from this course would include the following,—Farmers who now feel unable to breed their mares, fearing they may find they are short of feed, would not hesitate to breed every mare, knowing they would have a market for every head at any age, and if they were able to keep their horses until matured, might either sell to the government or to buyers of saddle horses, whichever they found most profitable. Our annual camps would soon be able to have at least two or three well horsed cavalry regiments, which would be a credit to Canada, instead of the bunch of three-cornered skates, which are hired every year for training purposes, making it impossible for the officers or men to do credit to the service, the great difficulty in hiring horses making it often necessary to have everything from a polo pony to a heavy draught horse in the same troop. The money now used to hire these horses would go a long way towards paying for the feeding of first-class suitable horses. Then men would enjoy the service more and many difficulties would be overcome.

Then comes the benefit in the future. We would become recognized as being great breeders of saddle horses and cavalry horses, if this system were put in practice at once. As soon as we arrived at a point where we had a number of horses ready for service, we should undoubtedly be allowed an annual subsidy from the Imperial government for first call on these horses in case of requirement, at a fixed price per head. This would also go towards defraying the expenses of such a remount station.

The market for Canadian horses to-day, taking into consideration the inroads the auto is making in the sale of the carriage horse, can be summed up as follows:—Ponies, saddle horses, city delivery horses and heavy draughts. I might mention that I am not representing any particular breed of horse when I make this statement, because when they come on the market to be sold they are all the same to me.

We have heard a number of very elegant speeches about the conditions in all branches of live stock, and so far have heard but very few suggestions as to a remedy. The foundation of all the agricultural interests is the draught horse, because he has to break the land to grow fodder to feed himself and all his kindred, and this is the breed we must look to to-day to meet the requirements of our vast northern and northwestern provinces.

The Canadian market to-day demands a heavier, cleaner-boned horse with more quality. I am going to make another suggestion. It is a well-known fact that the

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quality and supply of draught horses is diminishing every day, and strenuous efforts must be made, and made at once, to bring back what we once had,—draught horses fit to ship to any market in the world.

The great Canadian Northwest Territory is practically an undeveloped empire with almost unlimited agricultural possibilities. The most fertile wheat lands on the continent are on this zone awaiting development, and when improved will produce annually hundreds of millions of bushels of the gluten cereal for domestic consumption and exportation to Europe. With wheat nominally stationary at \$1 per bushel there is no business that offers greater financial inducements than exploiting the virgin wheat lands of the Canadian Northwest. This vast domain cannot be redeemed from virgin wilderness into cultivated farm land without the aid of horses and modern agricultural machinery. As the Canadian Northwest has developed a new and immense market for farming implements, so also has it created a marvellous demand for horses as motive power in agricultural operations. Buyers and dealers have been in Chicago markets in great numbers executing orders for carloads of horses for shipment to the undeveloped wheat lands of Canada. During the spring session of the market, train loads of farm chunks were purchased for consignment to the fertile agricultural lands of the northwest.

The mineral interests of our Dominion, we all agree, are wonderful and will eventually take care of themselves, but in the meantime the government is giving bounties to encourage the manufacture of a number of the products, such as pig iron, steel, etc., and at the same time neglecting the very animal that is the foundation of all our interests and one that has brought our Dominion, and especially Ontario, to the front as the banner breeding province of, I might say, America. This has all been done by private enterprise, with no help in any way from our government. I see by the papers, in the speech from the throne at the opening of the Ontario parliament, that the Dominion government are going to give substantial aid to the agricultural interests, and I suggest that some plan be adopted whereby there can be given a bounty on the imports of heavy draught mares. This is not asking much in the interests of the horse and could be carried out in some such manner as this,—the mares to be up to a certain standard, quality and weight, and to stay for a certain length of time in the province into which they were imported. The details of this suggestion could be worked out by the heavy draught societies and recommendations made to the governments, provincial or otherwise. I would also recommend the inspection of stallions, but, as Mr. William Smith is going to take up this subject, we will look for something practical from him.

I might say that for years to come there will be more money made by breeding heavy horses than in any other branch of the live stock industry.

From now on, our motto on the horse question must be, if we want to stay in the business, give the people what they want, and that is cleaner-boned, heavier horses with more quality, and more of them. Bounty the mares, inspect the stallions, and then probably, in five or ten years, if action is taken at once, we may have a surplus and take a hand in the export trade again, the same as we did a few years ago.

Discussion led by W. J. Langton, Esq., Superintendent Dominion Transport Company, Toronto, Ontario.

One thing Mr. Smith mentioned was the amalgamation of the Clyde and Shire. I think that would be a very wrong thing to do in the interest of heavy horses in this country. In going through the country buying horses, we often see stallions that would be much better if they were put into a cart to haul coal. Another thing I notice is the small cooped-up stables not properly ventilated or cleaned out. Horses from such stables very often bring disease with them. Sometime ago it was distinctly understood or proposed that there would be an inspection of stallions, and I think that matter ought to be brought before this body to deliberate on.

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Then again we have the shoeing question. Many farmers in sending a colt to the market will go to the nearest blacksmith shop and have clamped on a pair of shoes that should be worn by a light driver instead of putting on a new set of shoes of proper weight, the same as he would when sending his children to church or Sunday school. Some years ago the electric cars were supposed to take the place of horses, but we find it more trouble than ever to get good horses. Motor trucks are not practicable in this country, especially in the cities where the lanes are so narrow. Therefore, the draft horse is here to stay, and I think the farmers ought to be encouraged by the government to raise good draft horses. A prize should be given at all agricultural fairs for shoeing horses. That is done in the old country and has met with good results. We are badly in need of general purpose and express horses in this country, but Mr. Smith has already referred to that and I will not occupy your time any longer. I hope we will all go away from here reaping benefits from the remarks we have heard.

STALLION LEGISLATION.

William Smith, M.P., Columbus, Ontario.

The subject with which my name is coupled has been discussed upon so many occasions and at so many different kinds of gatherings from one end of the province to the other that it seems to a certain extent a hackneyed question. As long ago as twenty years, it was a live question in the province of Manitoba, and the Live Stock Commissioner for Canada introduced a measure in the Manitoba legislature dealing with this question. He commenced in these early years to lay the foundation work which he is carrying on to-day and for which, I believe, every live stock man in Canada is prepared to give him all the credit that is due him.

It has been a live question in some of the other provinces in Canada. It is a live question in Scotland, although they do not license stallions there. The Scotch people are so careful of the work they are engaged in, that it practically amounts to licensing. Belgium is following the same lines and France is quite as careful as any country that I know of, and in many of the States of the Union, action has been taken with regard to licensing. Our ideal should be for the protection of the very best, and that should be true of everything that is raised upon the farm, but especially should it be true of horses,—the best and purest bred and the best conformation that it is possible to have. My own opinion is that we should do something in the way of licensing, and we should do away with the grade stallion. I agree with Professor Cumming when he said here yesterday, 'We must suppress the scrub stallion.' How is that to be accomplished? Are we, year after year, to try to educate the people to that point or must there be some stringent measure taken? My own idea is this: You may go on year after year talking, but it will take a long time, away back in our country, in the new parts, to educate the people up to the point where they will do away with the scrub.

We tried to introduce a measure into the legislature at Toronto, and it was so mild that it hindered no one from using or travelling a stallion; the only thing about it was that the parties using that stallion would know more about it than they ordinarily do, and yet we could not get that bill through.

My idea in licensing would be that we should only use the pure breeds. It is true difficulties may arise. We will be told that there are grade stallions that are equally as good breeders as the pure breeds. That may be partially true, but it will only be true of the first cross, and if we try to continue on the work we do not know where we will land. If like will produce like, then there is only one safe rule to follow, and that is to only use the best pure-bred animal we can get. If that be the case, if we license stallions, the grade stallion will finally disappear altogether and that would

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be one of the wisest things to do. It would be a great thing for Canada if by licensing, we could accomplish that purpose. There is no doubt objections will be taken, and that is true of almost every law that is placed upon the statute books of our country. It might take a little nerve to make the law, but I am quite satisfied that before many years public opinion will be strongly in its favour and the men who would object to it at first would be its strongest adherents in the end. That being the case, I think it is wise that we should take into consideration the examples that we have from other countries where they have accomplished so much. Scotland, France, Belgium, and even Australia, have been moving in this direction. I do not see any way of doing away with the scrub or the grade stallion unless the law steps in and says that at a certain time they cannot have any place in our country.

I do not say that in licensing we should be extreme at the outset, but we should gradually work up to it, and we should do away with the grade step by step and gradually make the licensing more stringent in every possible way. If we do that now, the generations that come after us will rise up and bless the men who placed upon the statute books of our country such a law as I have briefly described.

I think it would be wise for this convention to state in no uncertain tone in a resolution, something on the lines I have spoken of. The attention of the people of the country may be drawn to the fact that we are moving on these lines, and then, perhaps, we could see on the horizon some little light glimmering, leading to the point I have spoken of here this afternoon.

Discussion led by Mr. Andrew Graham.

I have only a few words to say. I had a letter from Dr. Bell, who was to have led this discussion, stating that on account of a severe illness he would not be able to be here. We passed a Stallion Enrolment Act some years ago and it has worked very well as far as it goes. It requires all parties handling stallions to enrol them every year with the Department of Agriculture. If it is a grade stallion, it is enrolled as a grade stallion and the fee is 35 cents. If it is a cross-bred stallion, the certificate must show that he is a cross-bred, and if of a pure breed, the certificate shows that he is a pure-bred stallion. In order to pass as a pure-bred stallion, he must be registered in the records at Ottawa. That law is very good as far as it goes, but the grade stallion still continues to be used, and the owners even take these certificates of enrolment and pass them off as pedigrees on a lot of people.

The horsemen prepared a bill and it was taken to the legislature and it passed its first and second reading, but some members of the legislature thought it was a little too drastic and they referred it back to the agricultural societies. The bill was brought up at the Horse Breeders' Association and they altered it. The first clause asked that all grade stallions be eliminated from service and that met with general approval of the Horse Breeders' Association. That law was to come in force in 1914. Some of the clauses regarding soundness were rejected and other clauses inserted in their places. The bill requires a horse to be perfectly sound, and the agricultural societies throughout the country are all in favour of this bill. If any of you gentlemen have not seen a copy of it, you should secure one. It is called Bill No. 16 of the Province of Manitoba.

Dr. RUTHERFORD.—This is a subject in which I have for a great many years taken a deep personal interest. As Mr. Smith mentioned, I claim to be the originator of legislation of this kind in the Dominion of Canada. In the year 1893, when I was a member of the legislature of Manitoba, I introduced and was successful in having placed on the statute book of that province the first Act governing registration and licensing of stallions. It was somewhat of a rudimentary measure.

I was very much struck with the remark Mr. Andrew Graham used just now when he said that this draft bill, which is undoubtedly the most drastic and thorough-

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going piece of legislation of its kind which has ever been presented in any legislative body in Canada, has received the unanimous endorsement of the agricultural societies of the province of Manitoba. That shows more clearly than anything that ever came under my observation the advisability of going slow at the beginning in the introduction of reforms. In other words, get the thin end of the wedge in first. It is true that the patrons of industry and organizations of that kind were at the zenith of their political power in 1893, and some of the members of the Agricultural Committee were terrorized because it was looked upon as class legislation, and if it had not been for my friend, Bob O'Malley, bursting out with the expression: 'The doctor is quite right. I would sooner have a blizzard strike my farm than one of these scrub stallions.' I do not know that I would have succeeded in getting that bill through.

It has been a matter of constant wonderment to me that a province such as Ontario, in which reside all the leading horse breeders of the Dominion, men who have made the Dominion famous for its horses, has been content to lag along twenty years behind the little postage stamp province of Manitoba which, fortunately, is now a postage stamp no longer. The Ontario Department of Agriculture appointed a commission which did a very great deal of research work, with the result that figures were made available, and by using these figures I showed in a paper that I read last year before the Ontario Fairs Association that wherever you got the largest percentage of pure-bred stallions they were producing the right class of stock, and the districts in which these horses travelled were primarily the horse-breeding districts of the province, and that on the other hand, the backward counties were those in which there was a preponderance of stallions of the scrub variety.

These are the facts and figures, anybody can see them, and yet this intelligent centre of the breeding industry in all classes of live stock, particularly horse-breeding, continues to go on in the same old way perpetuating this folly which will keep back and retard the horse-breeding industry for years to come, until some action is taken.

I do sincerely trust that the Committee on Resolutions has not overlooked this matter, and that this convention of the National Live Stock Association will speak out with no uncertain sound on this great question so as to stiffen the backs of the Ontario legislators and make them see the light and follow the example of the western provinces, by passing such stallion legislation as will place the horse-breeding industry of that province on a good sound and proper footing.

TRANSPORTATION OF LIVE STOCK.

Peter White, K.C., Pembroke, Ont.

I am sailing under false colours to-day. I am misrepresented before you as one who is able to speak upon the question of transportation of live stock with that degree of knowledge which you might expect from a gentleman whose name is down on the programme. I must ask you to bear with the very inefficient substitute which has been provided while I endeavour to speak a few words on this important question, which is a very live issue in railway matters and in live stock matters in the Dominion of Canada.

In the early days of transportation, the railway was the rival of the horse, and at that time the railway was going to put the horse and the ox out of business. Of course, the horse and the ox still survive, and I am glad to say in ever increasing numbers and quality. In the early days of railways, nobody ever thought of shipping live stock by railway, and it was not until 1858 that it was possible to do so. In that year there were some live stock shipped on one or two of our English railways, and from that time to this persons who have been endeavouring to ship live stock over

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railways have had to go to the railway companies and almost on bended knee, beg them to take their live stock for transport from one place to another. I wish to place this matter before you as clearly as I can. The railway companies are and always have been, with certain limitations, insurers, that is to say, if you give a bale of goods to a railway company for shipment from the City of Ottawa to the City of Winnipeg, that railway company is bound to ship these goods to Winnipeg and deliver them to the consignee there or pay you the full value of the goods. That has never been the law in regard to live stock, and it will be quite apparent to any of you who stop to consider that that would be a very unreasonable state of affairs if the railway companies were asked to do that, because there is in live stock what there is not in dead freight, that quality which enables it to move itself and which railway companies call 'Inherent vice.' Inherent vice to the railway companies is the very thing which makes these animals valuable to us.

There are four documents governing the shipment of live stock on Canadian railways. First, you are asked to sign a special live stock contract, and that contract contains certain terms and provisos and conditions under which your stock is shipped. In addition to that there is what is called the 'tariff,' which sets out in detail the amount which you are required to pay for the transport of each class of animal from one point to the other, classified according to the distance to be transported. Curiously enough they have found it necessary to attach to the price certain conditions upon which you can ship these goods at certain prices, and other conditions upon which you can ship them at a certain other price. Then there is what is called a 'classification,' and that classification is something—to use an old hackneyed illustration—that you can fall down and worship without committing idolatry, because there was never in the heavens above or the earth beneath or the waters under the earth, anything like it. It is fearfully and wonderfully made. The fourth document is what is called the 'regulations' and, strange to say, these regulations are more unfavourable to the railway companies than favourable to them, and an application is now being made, I believe, to make them a little more unfavourable, with every hope of success. These are the four documents which govern a single shipment of live stock, and I suppose hardly any of us have ever stopped for a moment to consider that when we place a horse or cow or sheep or pig upon a freight train or in an express car in this country, we are virtually signing documents which are more complicated in their form, much more lengthy, much more difficult to construe, than a conveyance involving a transfer of land, perhaps, worth millions of dollars, but that is the exact position.

When the present Board of Railway Commission took office, they found that certain forms of railway contracts were in use and, *holus-bolus*, they adopted them merely for the sake of convenience. There has been considerable difficulty about live stock contracts, and for reasons best known to itself, and no doubt due to representations which have been made to it, the board of its own motion has asked the railway companies to submit a new special live stock contract, which they did, and in doing so they evidently forgot that things had taken a slight change in the Dominion of Canada. It must have been a rude shock to the railway companies, which are carefully organized and skilfully advised, as they are, to find opposing them in this matter an organization as good as their own. I won't say anything about the advice that organization has got, perhaps results will speak for themselves. To make a long story short, the reason that the railway companies have been able to foist upon the shipping public of this country, a contract which on the face of it is an unreasonable document—a child reading that document could come to no other conclusion—is that they were skilfully and highly organized, while the live stock men had no organization to meet them and, consequently, had no influence. There was no way of having concerted action and there was no person whose business it was to take this matter up, but largely owing to certain members of the Canadian Manufacturers' Associa-

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tion—and I may say to you that I think in this matter that we owe the Canadian Manufacturers' Association a debt of gratitude, because they have pointed out to us a way through which we may be able to get reasonable conditions from the railway companies or from the Board of Railway Commissioners of Canada, for the shipment of live stock—they have placed at our disposal the services of their experts. The assistance and technical knowledge of these gentlemen on this question has made it possible for Mr. Cowan and myself to take this matter in charge and prepare our brief, and we have been able to meet the railway companies' traffic experts face to face and upon equal and even ground, and it gives me pleasure to have this opportunity of testifying to the great advantage it has been to be associated with these gentlemen in this matter.

There are many features of this question which might be discussed. I might point out one matter in the classification: there are two rates, so called, for the shipment of live stock. There is the higher rate, so called, although we have refused to admit these terms by which, when you ship an animal and pay according to that rate, that animal is shipped at the risk of the carrier. When you pay the lower rate, then your animal is shipped at your own risk absolutely and entirely. When you want to ship an animal from Toronto to Montreal, and you think that the railway company ought to assume the risk of carriage, that is a matter not in the contract at all but in the classification, and we say that whatever is in this classification that is not a fair and reasonable contract for the shipment of live stock should 'go by the board.' On page 52 of the classification, number 15, we find that when shippers decline to have horses or other live stock transported at the following values—that is for horses or mules not to exceed \$100 each, and cattle \$50 each, and any other domestic animal \$10 each—they will only be taken subject to the terms and conditions of the bill of lading issued by the originating carrier at $1\frac{1}{2}$ first-class rate. We would not object to that very much if the railway company would assume the risk of carrying these animals. One and one-half first-class rate would not be too bad but that is not the whole story, because these animals are taken at certain weights, and we find that not only are you paying $1\frac{1}{2}$ first-class rate but in addition to that you are paying for a weight three and four times what you would pay if you assumed the risk yourself. When each animal exceeds \$100 in value and not over \$400, the weight for one animal is 4,000 pounds, and if that animal is \$100 or under, the weight is 2,000 pounds, so that you can send an animal worth \$100 at 2,000 pounds weight and only pay carriage on 2,000 pounds, but when you come to ship an animal worth \$101, you pay not only $1\frac{1}{2}$ first-class rate, but on twice the weight.

Take for example a horse from Toronto to Montreal, the first-class rate is 44 cents per 100 pounds if the value does not exceed \$100. The estimated weight is fixed at 2,000 pounds, that is you pay \$8.80 for taking that horse from Toronto to Montreal. If the value is \$150 and you want the carrier to assume the risk of the carriage of that animal, you pay $1\frac{1}{2}$ times first-class rate or 66 cents per 100 pounds and the estimated weight is 4,000 pounds, so that instead of paying \$8.80 for the transport of that animal, you pay \$26.40, or three times as much. That is how we get it when we sign a contract which refers to that classification, and I merely state that as one illustration of the conditions under which live stock of this country are being transported from one part of the country to the other.

Take another illustration. Up to now the law has been that where a man goes in charge of a live stock shipment, he is usually asked first to sign a release to the railway company. In one particular instance in which Burns & Shepherd, of Toronto, were shipping horses, one of their shipments was in charge of their man, who was killed on the way in. Unfortunately for the railway company and very fortunately for his family, he was killed by the negligence of the employees of the railway company, and his relatives brought an action against the railway company. The company

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brought Burns & Shepherd into the case and said they were liable, but the court decided that Burns & Shepherd were not liable, but that the railway company upon whose line the accident happened was liable.

The condition of affairs at present is this: that when they were asked to submit this new contract, they actually had the audacity to submit a contract which asked you to be liable for your employee who is in charge of a shipment of live stock and whose death might be caused by the negligence of the railway company. I had never heard of such a preposterous idea before, but that is what has been submitted to your representatives as a fair and reasonable contract, covering the shipment of live stock. It is the law of the land that there must be a person in charge of these live stock shipments, and the company will not accept them for shipment unless there is a person in charge, and the railway companies say, notwithstanding, this is the law of the land, we require the shipper not only to assume the risk, but also to indemnify us against any loss which we may sustain owing to an accident to your man in charge of your live stock, notwithstanding that that accident may have been caused by almost the asinine effort of some railway employee to run two trains on the same track going at great speed in opposite directions.

That is the position with regard to that and we simply say that we cannot stand it. We have assumed this position that there should be no general difference between shipments of live stock and shipments of any other kind of merchandise. We ought to recognize, however, that there is a certain risk in shipping live stock by rail. These animals will move about and they will injure themselves at times. Horses have been known to jump out of cars and we say that, in fairness, we ought to take care of any inherent vice. (I have to use that term because the railway companies' lawyers have been pumping it into me.) We admit that we ought to take care of that, but when once we have done that, then we want to be exactly upon the same terms as shippers upon any other class of merchandise.

If I ship an animal by rail to-day that is worth \$600 and he is killed, it is \$600 worth of damage to me just as much as \$100 of damage to a man who ships an animal worth \$100. You cannot make a contract with a railway company by which they are not liable for their negligence, but they can limit that liability to such a point that it brings it practically down to the vanishing point. In every shipment of live stock, you sign a contract which contains a condition that if that animal is lost owing to the negligence of the railway company, not only are you to be out of your time and so on, but you must actually accept, if it is a horse, \$100 as full compensation for your injury, notwithstanding the fact that the horse might be worth many times that sum. We say the company must assume the risk and that the car fastenings must be made properly, and that the burden of proof where accidents happen by the opening of a door of a railway car, must be upon the railway company to show that that door had a proper fastener, and not upon the shipper to prove that it had not a proper fastener. That point has been before the Railway Commissioners to-day and it is adjourned.

The contract which the railway companies submitted to us in the first place was so preposterous that we practically threw it back at them and they have now submitted to us for the first time an entirely new contract, and we have not had time to go over it thoroughly, but I may tell you frankly that I do not approve of all of it. There are things on the first two pages that are just as bad as they were in the first place.

I thank you for the very patient hearing you have given, and I trust when next we meet we may have a live stock contract with the railway companies which will at least embody reasonable conditions, even if we cannot get everything we ask for.

W. F. STEVENS.—I will take this opportunity of announcing that I have had placed in my hands a copy of the Manitoba proposed live stock shipping contract to which Mr. White referred, and I have had a number of copies typewritten, and we

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have arranged for the Alberta delegates to meet this evening to discuss this contract in order to express our views in writing to our solicitors. Any delegate from any other province wishing to meet with us has the privilege of doing so. Mr. White referred briefly to a set of regulations which has been submitted to the Board of Railway Commissioners, and which we hope will come up for hearing as soon as this contract has been disposed of. We want to have our live stock properly loaded and unloaded. I will not undertake to go into the details of this matter, but I may say that the western shippers are suffering from these difficulties and we are trying to have them eliminated.

SIXTH SESSION.

Committee on Resolutions.—A. W. Smith, William Smith, N. Garneau, C. A. Archibald, J. A. Telfer, Theodore Ross, James Duthie, Robert Sinton, George Lane, Alex. Davey, Lt.-Col. McEwen, Lt.-Col. Campbell.

A. W. SMITH.—Mr. Chairman and Gentlemen,—The Committee on Resolutions have prepared a report to present to this convention, and I will ask Mr. Westervelt, the secretary, to read that report to you. It contains all the resolutions that we wish to bring before the meeting.

Mr. A. P. WESTERVELT.—The Committee on Resolutions beg leave to report as follows:—

(1) That a Transportation Committee consisting of A. W. Smith, William Smith and Robert Miller be appointed to take up questions dealing with tariffs and shipping regulations.

(2) The following resolution dealing with express rates was referred to the Committee on Resolutions:—

That whereas the different express companies are allowed at the present time to charge 60 per cent extra over the eastern rate for the same haul, and whereas the shipping of single animals, particularly sheep and swine, between the four western provinces is done by express, therefore we, the live stock members of the National Convention assembled in Ottawa, February 12 and 13, 1912, believe that these rates are excessive, and that this convention request the Railway Commission to equalize the express rates in all parts of Canada for the same distance, and that a copy of this resolution be sent to the Railway Commission.

It is recommended that this question should be referred to the Committee on Transportation.

(3) Correspondence from British Columbia to the Live Stock Commissioner regarding rates to horse shows was referred to our committee, and it is recommended that the Transportation Committee be asked to deal with this question.

(4) The following resolution was referred to our committee and it was recommended that the Transportation Committee be asked to deal with it:—

Whereas it is greatly in the interests of the horse industry of Canada that every opportunity be provided to enable farmers to breed their mares, both grade and pure-bred, to pure-bred stallions, and

Whereas it often transpires that the only opportunity of accomplishing this is by shipping mares to those centres where pure-bred stallions are kept,

Therefore, be it resolved that this National Live Stock Convention do strongly urge the management of the various railways in Canada to make such provision that

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mares shipped to be bred to pure-bred stallions should, after full rate to the railway stations, where such stallions are kept, be returned free, and that this convention do appoint a committee to bring this matter before the railway managements.

(5) The following resolution was referred to the Committee on Resolutions by the Special Committee on Horses, and it is recommended that it be adopted by this convention:—

Whereas legislation in regard to stallion registration is now in force in four provinces of the Dominion of Canada, and

Whereas such legislation has already been effective in improving the character of stallions in public service in those provinces,

Therefore, be it resolved that this National Live Stock Convention do strongly recommend the governments of those remaining provinces in which such legislation is not in force, to pass legislation for the control of stallions kept for public service in those provinces,

And further be it resolved that the secretary of this convention do send a copy of this resolution to the Ministers of Agriculture in these various provinces.

(6) It is recommended that the following resolution be adopted following the discussion on bovine tuberculosis:—

Resolved that in the opinion of this association, it is eminently desirable that the Dominion government should, at the earliest possible date, suggest a policy having for its object the control and, as far as possible, the eradication of bovine tuberculosis on the lines recommended in the report of the International Commission.

(7) The following report was submitted to our committee by the Special Committee on Horses:—

‘Your committee would suggest for the consideration of this association the advisability of commending the Minister of Agriculture on his suggestion made in Toronto at the dinner given by the Holstein association last week, to divide his Department between deputies, one to have charge exclusively of the agricultural work of the Department, and trust he will complete the arrangements as suggested.

‘And further, this association would respectfully suggest that there be appointed a Bureau of Live Stock Industry comprising a permanent chairman and four members, one representing the west, one the east and two from the central portion of the Dominion, whose duty it shall be to regulate, encourage and foster in every way the interests pertaining to the live stock industry, subject always and only to the sanction and approval of the Minister of Agriculture.’

It was decided to forward this report to the convention for discussion.

(8) The following resolution was submitted by the Special Dairy Committee:—

‘Moved by W. F. Stephen, seconded by B. Mallory, that we, the members of the National Stock Breeders’ Association desire to place on record our most hearty appreciation of the earnest and untiring efforts on the part of the Department of Agriculture of the Dominion government in the organization and carrying out of the Record Performance tests.’

It is recommended by the Committee on Resolutions that this resolution should be adopted.

(9) The following resolution was submitted by the Special Dairy Committee:—

‘Moved by R. Reed, seconded by W. F. Stephen, that the Department of Agriculture of the Dominion government be approached and requested to enact a law that in the sale of milk for domestic use, to creameries or cheese factories, the butter-fat percentage shall be the basis upon which payment shall be made.’

This resolution is referred to the convention for discussion.

(10) The following resolution was referred to our committee by the Special Dairy Committee:—

‘Moved by R. Ness, seconded by R. Reid, that in the opinion of this, the National Stock Breeders’ Association of Canada, a veterinary inspector or inspectors should be

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appointed permanently in Great Britain for the examination of pure-bred stock previous to their shipment to this country and that they should always be at the service of importers.'

It was decided to refer this resolution to the convention for discussion.

(11) The Resolution Committee recommend the adoption of the following resolution:—

'Moved by Lt.-Col. McEwen, seconded by Lt.-Col. Campbell, that the members of this convention wish to place on record their appreciation of the action of the Minister of Agriculture in bringing together the representation of the live stock interests of Canada for the purpose of discussing matters relating to live stock; and this association respectfully suggests that some permanent arrangement be made by the Minister to enable this association to hold a convention once every two years.'

(12) The committee recommend the adoption of the following resolution:—

'Moved by Lt.-Col. Campbell, seconded by James Telfer, that this association wishes to express its hearty appreciation of the work performed by Dr. J. G. Rutherford, Live Stock Commissioner and Veterinary Director General, in the interest of live stock in Canada and the able manner in which he has administered these branches.'

(13) The adoption of the following resolution was also recommended:—

'Moved by Lt.-Col. McEwen, seconded by C. A. Archibald, that a vote of thanks be tendered to all those who have taken part in the programme before this convention.' All of which is respectfully submitted.

(Signed) A. W. SMITH, *Chairman*.

(The report of the Resolutions Committee was then taken up clause by clause.)

(1st clause read and carried.)

(2nd " ")

(3rd " ")

(4th " ")

(5th " ")

(6th " ")

(7th " ")

A MEMBER.—Would the mover of that resolution explain his ideas with regard to it?

Mr. JOHN BRIGHT.—In moving the adoption of this report from that committee which was appointed yesterday, I might say that your committee considered favourably the message that the Minister of Agriculture brought to Toronto at the dinner given by the Holstein Association last week. They felt like commending him on his good intentions of doing what we feel, and have felt for sometime, would be very beneficial to the live stock interests of this country, namely to have a Deputy Minister of Agriculture, who was in every sense of the word a Deputy Minister of Agriculture, and who would not be hampered with the different lines, such as patents, copyrights and census. We believe the agricultural interests of this country are of such importance that a Deputy Minister or even a Minister should attend to them without having any other business to look after, and that is why your committee decided in favour of commending the Minister for what he said last week in Toronto.

Then your committee thought the live stock interests of the Dominion of Canada were large enough to have a Bureau of Live Stock Industry to work out the best interests of live stock in the Dominion. We believe it is a move in the right direction. We are not finding so much fault with the way it has been handled in the past. I do not wish to take up any more of your time, but I trust you will meet this resolu-

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tion favourably and pass it on to the Department of Agriculture as a recommendation for the advancement of our interests. I move the adoption of the clause.

Col. McCRAE.—I do not rise to second it. I rise to object. I do not like the preamble of that resolution. I do not think we need to go into any history of what was done at Toronto. If this is necessary, we might as well start right out and say it. I think the preamble ought to be dropped, and we ought to pass a straight resolution saying that we think so and so should be done.

Mr. JOHN BRIGHT.—The reason we took up that preamble, as you call it, was the fact that the Minister of Agriculture was reported to have said at Toronto the other evening, something, and we felt that he should be commended for saying it. Instead of coming out at this meeting and demanding or suggesting something fresh, as if it were never in his mind, it was in the mind of the committee to stand behind him and to strengthen him in carrying out the good intentions that he evidently had in mind when he spoke in Toronto.

Col. McCRAE.—Then I think whether he said it or not, it ought to be adopted. It is a good move and some of us have thought that way for a good while. In fact I can say that the late Minister of Agriculture had a suggestion along this line made to him before the present Deputy Minister was appointed, that he should get the very best live stock man in the whole Dominion of Canada to fill that position.

A MEMBER.—We felt that way fifteen years ago.

Col. McCRAE.—I have no objection to the gentleman who fills the position, still I think that a gentleman belonging to the legal profession is not the very best man to put in that place. He is not in touch with the live stock interests of this country, and if you will drop that preamble I am quite willing to second the motion.

Mr. CLEMONS.—There seems to be some doubt as to whether the Minister said it. I will vouch for his having said it because I heard it.

The CHAIRMAN.—Will you second the motion?

Col. McCRAE.—No, I will vote against it.

(Motion seconded by Mr. McPhail and Mr. Bredt.)

The CHAIRMAN.—You have heard the motion and there are two seconders, is it your pleasure that this resolution shall be accepted?

Col. McCRAE.—I think it would be better to have it read over again. There is a second part to it on which there has been no discussion.

(Motion put to the meeting and carried.)

(8th clause read and carried.)

9th clause read.)

Col. McCRAE.—That is a very important matter.

Mr. G. W. CLEMONS.—I move that that be adopted.

Mr. W. W. BALLANTYNE.—I second the motion.

Col. McCRAE.—They state there butter-fat and they do not take into consideration the other solids in the milk.

The CHAIRMAN.—My opinion would be that the butter-fat would be taken into consideration along with the other solids.

Col. McCRAE.—I think the other matters ought to be considered. I am not a dairyman and I do not know anything about it, but I know there are other things in milk besides butter-fat.

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Mr. CLEMONS.—If you have 4 per cent milk, they add 2 per cent and call it 6 per cent milk and that provides for the other solids in the milk. That is Professor Dean's method.

Col. McCRAE.—This resolution is just the opposite of that. It says butter-fat.

Col. CAMPBELL.—When that resolution came before the Committee on Resolutions, it was simply referred back to this meeting for explanation, and I think we should have an explanation as to why this should pass.

Mr. CLEMONS.—Where they buy milk at the cheese factories by the test, they add 2 per cent to the butter-fat so as to take in the other qualities in the milk. I have been at meetings of cheese factories where they are paying by the pooling system, and the cheesemaker has taken twelve pounds of milk to make a pound of cheese, and I think this paying by the test will result in a great deal of good.

Mr. RUDDICK.—If it is in order, I would like to say a word on this question. This is a matter with which I as a dairy expert, have had something to do. Ever since the question was proposed in this country of paying by test in cheese factories, I have been interested in it. I believe I was the means of having the first factory in this country adopt that system. We have had a great deal of difficulty over this question and it would not serve any purpose to discuss technicalities here, but I should regret very much if you passed that resolution in its present form, because it would be a great mistake and I do not think you know what you are passing—if you will allow me to put it in that way. If you say that milk should be paid for according to quality, I think that would cover the point, and leave the matter of working it out to those who have to do with the tests. We had a conference here, under the auspices of the Department, a few weeks ago, and that was one of the main questions which were discussed, and we were not able to come to a definite conclusion as to what particular plan was best to recommend, and we decided to make some further investigation during the coming summer and we hope to be able to arrive at some unanimous agreement and have a definite plan to lay before the cheese factories. At creameries they pay according to fat content, and it is a very important thing to the cheese factories. I hope that you will not pass that resolution as originally presented to the meeting.

Mr. CLEMONS.—One object in moving that resolution was that I am secretary of the Holstein Association, and it is a common thing in the country to discredit Holstein milk, and I thought if I moved this resolution, it would show the public that we are not afraid to have our milk tested and paid for by the test.

Mr. BALLANTYNE.—I move that the resolution be changed, and instead of stating to pay according to butter-fat, that it would be paid for according to quality. I think it should be made quite plain that in creameries, they should pay according to butter-fat. I believe in eastern Ontario, a number of creameries are paying according to the pooling system and that is very unfair.

Mr. RUDDICK.—I do not think there are any creameries paying that way.

Mr. BALLANTYNE.—I have been told that there are a number—some in Quebec and some in eastern Ontario.

Mr. RUDDICK.—There may be in Quebec, but I do not think there are any in Ontario.

Mr. SMITH, Dewdney, B.C.—I move that that resolution be left over until we get a report from the dairy experts. I think we are only losing a lot of good time.

Mr. CLEMONS.—I will withdraw the motion.

The CHAIRMAN.—You have got to withdraw it because you have no seconder.

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(Moved by Mr. Smith, of Dewdney, B.C., and seconded by Mr. Hubbard, that this resolution be left over until the question is decided by the dairy experts, Carried.)

(10th clause read.)

The CHAIRMAN.—In my opinion, the Scotchmen are no better than they should be. I bought a heifer that was tested by a veterinarian over there and I brought her here and she died of tuberculosis. She had come through quarantine and everything else. I was satisfied that she did not get proper attention. I think it is quite right to put that resolution in the way it is. I would like Dr. Rutherford to give a few words of explanation.

Dr. RUTHERFORD.—Mr. President and Gentlemen,—This is a resolution which somewhat affects the internal economy of the Health of Animals Branch, which is one of the branches of the Department over which I have supervision. The reason why the policy of keeping a veterinarian in the old country was abandoned after having received a fair trial for a few months, was the practical impossibility of getting a fair chance to test the cattle. I, myself, for some eight months occupied the unenviable position of official tester of the Canadian government in Great Britain. It is very easy to talk about, and if the number of importations of cattle is comparatively small and they come at reasonable distances apart, it is not impossible to get things done properly, but when you get a letter, as I used to do, from one importer saying that he had bought, perhaps, forty cattle for shipment to Canada and wanted to have them all tested at twenty different places, it is an entirely different matter. This letter, I would receive probably on the 4th or 5th of the month and he would want them all tested by the 15th of the month, and then, before the work was well started, I would have a like communication from some other Canadian importer, so that it was quite often an utter impossibility to even get from one place to the other within the prescribed period, to say nothing of properly testing the cattle.

That sort of thing went on all summer, and during those eight months I hardly ever sat down. You can understand what a magnificent opportunity such a system gives an unscrupulous owner to do up a veterinarian no matter how careful and conscientious the latter may be. There is not time to give the work proper care and attention. The breeders will not send their cattle to any common point of shipment in order to have them tested, and you can understand why, because if any of them were shipped back, that would mean disgrace from that time on.

The testing done by many old country veterinarians is not reliable. An occasional veterinarian in the old country can be depended on to make reliable tests, but the great majority will not take the trouble to do it properly, and the methods followed are, in some cases, almost incredible. In fact it was a very common experience on the part of owners and breeders over there after I had been at their places and made a test, to say that was the first time they had ever seen cattle go through the tuberculin test, although veterinarians had often previously been there to test cattle for export. The results are shown in the case of cattle exported for the Argentine Republic. I took this matter up with the Dominion Cattle Breeders' Association in 1903, and after explaining the whole situation to them, the present arrangement was agreed upon and I got an agreement in writing from the Dominion Cattle Breeders' Association, which is on file, and the present system was then adopted and has been found to work fairly satisfactorily.

It is unfortunately true that a man will occasionally get an animal over, for which he has paid a comparatively high price, and have it tested in quarantine at Quebec or St. John and it will go home with the official T on its right ear. Some of the breeders object to having animals marked in that way, but as far as the general health of the cattle of the country is concerned, it is infinitely better that an animal should be properly marked as a re-actor than taken home and put into some healthy herd unsuspected.

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Capt. ROBSON, London.—In the old country they have sales, and at these sales the cattle are tested and have to pass the tuberculin test. Can you tell us if these cattle are properly tested?

Dr. RUTHERFORD.—I have already told you that I have but little faith in the tuberculin test as performed by many veterinarians in England.

(Moved by Col. McCrae, and seconded that the motion be laid on the table. Carried.)

(11th clause carried.)

(12th clause carried.)

(13th clause carried.)

REPORT OF NOMINATING COMMITTEE.

Professor CUMMING.—Mr. Chairman and Gentlemen,—Sometimes it is difficult to get enough men to fill offices available. This time the trouble has been not to get the men, but there have been so many names to choose from that we have had difficulty in knowing whom to leave out. With that explanation, I beg leave to move that the following be the officers of this association:—

President—Andrew Graham, Pomeroy, Manitoba.

Vice-President—John Bright, Myrtle, Ontario.

Executive Committee—Hon. N. Garneau, Quebec; P. M. Bredt, Regina, Sask.; Capt.

T. Robson, London, Ontario.

Secretary-Treasurer—A. P. Westervelt, Toronto, Ontario.

Directors—British Columbia, A. D. Patterson, Ladner; Alberta, John A. Turner, Calgary; Saskatchewan, Robert Sinton, Regina; Manitoba, A. C. McPhail, Brandon; Ontario, W. W. Ballantyne, Stratford; Quebec, Victor Sylvestre, Clairvaux; New Brunswick, Lt.-Col. Campbell, Apohoqui; Nova Scotia, M. Cumming, Truro; Prince Edward Island, Hon. M. McKinnon, Charlottetown.

The CHAIRMAN.—We are now going to have the honour of an address from our worthy Minister of Agriculture, the Honourable Martin Burrell, and I am sure you will all be delighted to hear a few words from him.

ADDRESS.

Hon. Martin Burrell, Minister of Agriculture, Dominion of Canada.

MR. CHAIRMAN AND GENTLEMEN OF THE LIVE STOCK ASSOCIATION:

Do not look alarmed, I am not going to make another speech, but your chairman has kindly asked me if I cared to say a word, and I would like, before you all separate, to express the peculiar pleasure I feel in knowing that you have all been gathered here together to discuss questions affecting your common interests, and to crystallize your deliberations for the betterment of your industry into suggestions for legislation, some of which, I hope, it may be possible for the government to carry out. I notice that you have passed a resolution suggesting that the Minister should approve of some way of calling you together oftener than every four years. It is four years since you were here last. If it is thought desirable that this association should come together

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earlier than four years, I will be very glad to take that matter into consideration. It is only natural that you should expect me to do anything that will meet your interest and will advance your own business. Speaking for the government and speaking for myself as Minister, I shall be only too glad to do anything in my power to help along the live stock interests of the Dominion. I have had the privilege of having one or two of you gentlemen wait on me with suggestions, some of which I confess appeal to me favourably.

Although these resolutions seem delightfully easy to those who pass them, it is sometimes not so easy to pass them in the House of Commons where everybody is not a stock-raiser. I think you understand some of these difficulties.

I regret that it won't be possible for me to stay through the session, but I wanted to be here as much as possible so as to get the benefit of your discussions. Let me thank you again and wish you all luck and prosperity during the present year.

The CHAIRMAN.—We will now proceed with the usual programme, and I have much pleasure in calling upon Mr. Robert Miller to speak on the 'Regulations Governing the Import and Export of Live Stock.'

REGULATIONS GOVERNING THE IMPORT AND EXPORT OF LIVE STOCK.

Robt. Miller, Esq., Stouffville, Ont.

Unfortunately circumstances over which I have had no control have prevented me from preparing a paper on this subject, and the little preparation I have made has been chiefly since I came here this morning.

I propose to say something of the regulations or the want of regulations that have existed in Canada since the first importations of pure-bred animals were made into this country. It was a common subject of discussion in the house in which I was reared that the first importations of pure-bred animals took place to this country about the year 1830, and, up to the year 1881, the business of importing live animals into this country was chiefly carried on between Great Britain and Canada and it had rather an uphill career. In the first place, if a breeder bought a horse to be imported to this country, he had to settle with the sailing ship companies and agree to pay them £50 for the carriage of that horse to this country—\$250, no matter whether the animal was large or small, that rate was charged. If we bought cattle, we had to pay £30 apiece, or \$150, to the sailing ship companies.

I first began making importations in the year 1881, and after paying a good sound price for the animals in the old country and these exorbitant fees for the carriage of them across, we only landed 50 per cent of the animals that were purchased and for which carriage had been paid at these rates, and I think I am speaking reasonably when I say we had a tempestuous career up to that time. As I said before, I made my first importation in 1881 and the second in 1882, and I had every dollar I possessed on the face of the earth invested in the shipment of horses in that year, and the halters came home without any horses, so that I was stripped of what little money I had saved up to that time.

After 1881, we had to pay 12½ guineas insurance on animals, but changes have been made so much in our favour since that, that you can now get insurance for 2½ per cent or 2¼ per cent, and we have had better profits from importing animals and selling them again. We have never received any particular assistance from the government in that regard. Up to 1881 and for a good many years after, not many animals were imported from the United States. We did not have to show any certificate of registration, and up to a few years ago we did not have to have them examined

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by a veterinary surgeon, but the natural feeling in this country as to the conservation of the quality of our animals has made us take greater precautions in many ways. We have also desired to conserve the health of our animals, and restrictions were put on and the animals had to undergo a certain examination and now we have to show a certificate of registration. That certificate of registration might be almost in any form up to a few years ago.

This association has done one good thing in the fact that you impressed upon the ex-Minister of Agriculture the great necessity of having a uniform certificate of registration presented for every animal before it can be brought into the country as a pure-bred animal free of duty and sold in Canada as a pure-bred animal. We impressed that upon the ex-Minister, and after a great deal of pressure he finally gave us what we asked for, so that to-day, we have comparatively good regulations governing importation of pure-bred animals into this country, and no man can go abroad and buy an animal and have it brought to Canada free of duty without showing at the lines that it is a pure-bred animal. That is worth a great deal, because under the conditions that existed before that time, animals were brought into this country and they are still here and they are nothing but grades, but were passed as pure-bred.

After the American war, there was a great scarcity of animals in the United States and quite a trade was worked up between Canada and the country to the south. There was a duty of 20 per cent placed on horses, and we had to give an invoice value of these animals, and there was an inspector at each port and it was left to that inspector to say whether these animals were properly valued or not. If he said they were, they were passed into the United States with 20 per cent duty; if he said they were not, then the animal was seized and sold by auction and the inspector received half the money that the animal was sold for, so that the men who came over here and purchased horses took great chances.

That condition of affairs could not be very satisfactory either to the men importing from this country or men exporting. There was a change made and the duty was taken off animals but they had to be inspected before they went into the United States, and if the inspector decided these animals were good enough to improve the general stock of the country, they were accepted, and if he decided they were not, they had to pay a duty of 20 per cent on the value. That also became unsatisfactory and then they said: 'We must have a certificate of registration for each animal before it can come in free of duty.' Fraudulent certificates, with one or two exceptions, were presented, and these were soon found out and exposed. After a time, the government of the United States came to the conclusion that they knew more about what should constitute a certificate of registration than the live stock associations either in Canada or the United States, and they said, 'These certificates must be constructed in a certain way to show the sire and dam and the two grandsires and two grand dams.' That was difficult to comply with in some classes of live stock but, however, we complied with it and then they changed the regulations again. During the last calendar year, the regulations governing importations of live stock into the United States were changed four times and we had to meet these changes and sometimes we suffered losses in doing so.

Some few years ago, the question of our regulations regarding pure-bred animals was brought up by Dr. Rutherford, and I was entrusted with the presentation of the case as it affected the live stock breeders in this country, and after looking through the regulations, or purported regulations, I came to the conclusion that we simply had no regulations at all governing the importation of pure-bred animals into this country. Any sort of a certificate could be presented to the customs house officer and he allowed that animal in free of duty, and the consequence was that many of the animals were not pure-bred. We asked that a change should be made, and we asked that the Canadian record should be the only record that would be recognized for customs purposes by the Canadian government. And I say we should be proud of

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our regulations, because they are plain and simple and effective, and they are reasonable.

We asked that a change should be made governing the importation of horses for working purposes. Before that time, the great majority of the horses came in at a valuation of \$10 each with a 20 per cent duty charged up against them, and the result was that very many of the horses that came in here cost about \$2 each for duty. We came to the conclusion that we did not want horses in this country that cost in the neighbourhood of \$10 in the United States, and I think that was a very wise conclusion. The men in the western country said they were beginners, homesteaders on that land, and they could not afford to pay very much for a horse. I contended it was no kindness to make it easy for a man to get a horse to put on that new land that was only worth \$10. I say there is no greater enemy to a farmer than to have a horse that is absolutely no good. I am pleased to say that after a time we got a little change in that direction, and we now have a minimum valuation of \$50 placed on each horse and the duty raised to 25 per cent, so it is impossible for a man to bring in any kind of a horse to this country without paying at least \$12.50 duty.

I will give you some idea of what that change brought about. In the year 1901, there were 8,836 horses imported into this country at a value of \$275,000, or \$31 each. I told you that if a horse were placed at a value of \$10, it could gain entrance, but part of them were placed at quite a high value, so that it made an average of \$31.10. In the year 1906, the value was placed at \$50 each, and 17,000 horses came to this country and the average value was \$62.90. In the year 1907, before this new regulation came into effect, there were 16,000 horses imported and the value was \$52.80. In the year 1908, after this little change was made and was in operation, there were only 6,000 horses imported at a value of \$190 each.

I want to ask you if you did not find that change was a benefit, and I want to ask you if you can remember the class of horses that were going into that western country to compete with the horses that were coming in from the United States. We were shipping the cheapest class of horses that could be found in the province of Ontario to the west. They were purchased here and taken out there and sold for what they would bring. After that change was made and the minimum value of \$50 had been fixed, the result was these people said, 'We must have a change and we cannot sell these old skates out there at any price; the farmers won't have them,' and then they bought the best horses they could buy, and to-day you can scarcely get horses in Ontario good enough for these western provinces.

Look at what was brought about by that little change, and I say that the convention that met here three or four years ago should be thanked for bringing about that change. The resolution was passed in the face of some opposition. Some arguments were brought up against it, but finally it carried by a large majority and the results have been splendid, and there is soon going to be no country on the face of the earth that can set up their whole population of horses and compare them with the horses in Canada without Canada showing up the best and coming out of the contest with flourishing colours. We have asked another change to be made and it is being considered by the Minister of Agriculture.

Before we can send a horse to the United States, we must pay duty on the value of \$150, no matter what that horse is worth. The result is that the horses that have been going from this country into the United States were valued as follows: In the year 1901, \$119 each, and at that time the horses we were importing from the United States came into Canada at a value of \$31.10. In the year 1906, the value of the horses coming from the United States to this country was \$62.90 and the horses that we exported to the United States were valued at \$190 each. Do you think it is a good thing that we should be forced to send out that class of horses before we can get a market for them in that country, while we encourage them to bring into our country a class of horse that can do us no good and that they are anxious to get rid of?

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In the year 1908, after the change I have referred to was made, the horses that came into this country were worth \$190 each, and I will admit that there has been an increase in value since that time, but the horses that went from this country were worth \$227 each. In the year 1909, the value of horses that came into this country went down to \$87, while horses that went from here to the United States were valued at \$172. In 1910, the horses that came into Canada were valued at \$66. We were not bringing in high-class horses, because they were worth more in the United States than in this country. In the year 1911, they were valued at \$85, and the horses we sent into that country were valued at \$217 each, and only about \$2,000 worth altogether. We asked that that minimum value of \$50 placed on horses coming into this country be increased to \$150 so that we will stand exactly on the same footing as the people we do most of our business with in this country.

With regard to pure-bred animals, we have no fault to find with conditions as they exist, especially with regard to cattle, because we are not getting any competition in that line but what we can meet quite easily, and we feel that we are short of cattle and we need all we can get. You might say the same state of affairs exists with regard to horses, and so it does up to a certain point, but there are gentlemen in the United States who import horses, and it is a matter of public notoriety that some of these men are not recognized as reliable men in their own country. They send horses with certificates to this country, and in many cases they are accepted because they comply with our regulations and yet the signatures of these men would not be accepted by associations which they have helped to form on the other side. They send scores of horses in here to 'stool pigeons' in this country who say they are British subjects and that they are entitled to bring in these animals and they are the owners of them and they pass them into this country free of duty. In many cases it has been found that they have presented certificates that were not issued for the animals at all. They have been known to change the ages on certificates, and we have some cases to deal with showing that these men have no partnership or interest in these animals whatever, and that they have simply lent their names and have been working for wages and selling the animals here, and the money that is paid for the animals is passed over to the real owner who lives in the United States.

I remember quite well quoting to you one particular instance that came under my observation near the City of Moosejaw. I saw a very big horse there, perhaps one of the biggest horses I have ever seen, and the man in charge told me he was a wonderful horse, a Percheron, bay in colour. I could not have told what breed he was by his colour or his legs. I think he was a mixture of two or three breeds. The man in charge said the company that owned him had paid \$5,000 for him. To cut it short, he was the biggest and worst horse I ever looked at, but he had one redeeming feature and that was that he did not leave any progeny in that country, and these men lost their \$5,000 and their time. The man who brought that horse into this country was not responsible to anybody in this country and not responsible to many people in any other country, but he got his \$5,000. The fact that he sold that horse discouraged a lot of men who were willing to invest their money in trying to do something for the live stock business. I say that a man who has the right to bring pure-bred live stock into this country free of duty, should not only be a British subject but he should be a resident of this country, and if more than one man has part ownership in that animal, each one of them should be residents of this country as well as being British subjects. We are asking for a change for the protection of men who invest their money in these valuable horses, and I believe it is the opinion of every man interested in the welfare of the stock business of this country that that change should be made. All we want added to the regulation are the three words that were taken from that regulation after that regulation went from this National Live Stock Convention three years ago: 'resident of Canada' was removed from the regulation as we recommended it to the Department of Agriculture at that time, and I say the remov-

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ing of those three words was a very great mistake. I said at the time that by doing that, they took the sting out of the whole thing. I would like to have the sense of this meeting as to whether it would be a judicious thing to add those three words that were taken from this regulation as we passed it three years ago, and in order to bring it before the meeting, I will make a motion and ask every man in the room to stand up and say whether he would like to have these three words added to the regulations as they now exist, and I move that the words 'resident of Canada' be added to the regulations as they now exist.

Capt. ROBSON.—I second that motion.

Mr. ROBERT MILLER.—The regulation as it stands at the present time is that in order to import an animal into this country free of duty, the importer must be a British subject and he must present a certificate of registration in the Canadian National records, and must have complied with the regulations in force by Dr. Rutherford's department. You cannot follow a man into the United States and get justice, and even if you did it would cost more than it would to stand the loss sustained by the fraudulent sale, and the result is that in ninety-nine cases out of one hundred the men in this country have to lose.

Col. CAMPBELL.—Before the motion is put, I would like to hear from Dr. Rutherford on that subject. I remember when the motion was made, Mr. Miller made the same remarks, four years ago, that he has made here to-day.

Dr. RUTHERFORD.—I do not know that I have anything special to say. The resolution was passed in the terms in which Mr. Miller wishes to pass it to-night, but after giving the matter due consideration the Minister decided that in view of the fact that it contained a somewhat unkind suggestion to our friends who are British subjects and not resident in Canada, but resident in England, Scotland and Ireland, and who are in a somewhat different position from the American people, it would hardly be advisable to go the whole way and narrow down the issue to the exact point that this association wished.

Mr. JOHN A. TURNER.—I think Mr. Miller is out of order. There was a Resolutions Committee appointed and why did not Mr. Miller hand that in? I arrived late here from Alberta, and I spent four days coming down and I will spend four more returning. We have listened to some very able papers that we were glad to hear, but at the same time I think at this convention there should be a little more time devoted to business. I am not objecting to the resolution, but I think it is out of order to bring it in at a meeting of this kind without giving the other members of the committee time to consider it.

Mr. MILLER.—I could not deal with this matter until this time because I was not here when the committee was appointed.

Mr. TURNER.—Neither was I, and I have sat here doing nothing ever since I came.

Mr. MILLER.—If the breeders of horses in this country think it is better to leave it the way it is, I am perfectly satisfied.

A MEMBER.—I understand you just want an expression of opinion with regard to the matter.

Mr. MILLER.—That is all I want, and that is what this convention is called here for.

Mr. SINTON.—How would this resolution affect the resolutions with regard to immigrants coming in from the south?

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Mr. MILLER.—They could bring in any kind of horse so long as they brought it in as 'settlers' effects.' This has nothing to do with settlers coming into the country. We are speaking of the importation of pure-bred animals for breeding purposes that are allowed into the country free of duty.

A MEMBER.—It has reference only to horses from the United States?

Mr. MILLER.—No, it refers to all horses imported from any country. I have simply mentioned the United States oftener than I have mentioned any other country. That is exactly the objection the Minister had to these three or four words being attached to the regulation, he said, 'We would be saying to the men in the United Kingdom that we did not want them to bring horses into this country free of duty.' There is a little sentiment in that and I like sentiment of that kind, but the chairman sprang the key note when he said that 'Scotchmen were no better than they ought to be,' and we need that clause in here to protect ourselves against unscrupulous class of Scotchmen that buy and sell horses, and you will not find men in any country whom you want to be guarded against more carefully than certain men who handle horses in Scotland. I have just as much good feeling towards the people in Scotland as any other man, because I come from there, and my grandfather was a horseman in that country. I am not speaking of them as a class, but I am speaking of special men who sometimes make shipments to this country of horses that they could not sell in their own country. Therefore, I say it is no hardship to say that those who import pure-bred animals shall live in Canada.

Mr. A. W. SMITH, Maple Lodge, Ontario.—As there seems to be some doubt as to whether those words should be put in or not, I might say that the committee is still in existence and I can convene them in a few minutes and hand that motion in in the regular order.

Mr. MILLER.—I would be pleased to have that done. I did not know just how to get at that.

I wish to congratulate the chairman on the good work that has been done at this convention in the past. I am very pleased, indeed, to see the increased interest that is taken by the responsible men of this country in the live stock business. I know those who come here do so at great sacrifice, and I am pleased to see that some of the best men from all parts of the Dominion of Canada are interested enough in the work to come here and deliberate with regard to the little details that come up in connection with the live stock business. This association has done good work in the past, and I believe it always will do good work in encouraging the breeding and importing of really good, sound, reliable well-bred animals.

THE CHILLED MEAT TRADE.

E. G. Palmer, Edmonton, Alberta.

In addressing you upon the chilled meat trade, I must ask you to pardon me if my remarks appear somewhat disjointed, as since receiving the very kind invitation of the executive. I have had no opportunity in which to prepare an address and, therefore, what I have to say will partake more of the nature of a talk on the question.

In the first place it may be as well to point out that chilling and the chilled meat trade has reference to the preservation and marketing of meat and other products at a temperature above its freezing point. To illustrate what it means to a country to be able to market its produce in this manner. I will just take one commodity, viz., beef, it being probably the one in which you are more particularly interested.

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Now, the freezing point of beef is about 27 degrees F., and it is possible to keep beef in a thoroughly sound and saleable condition at slightly above that temperature for about six weeks. After this time putrefaction will make its appearance and the meat will rapidly become off-colour and unsaleable as a first-class article. From this you will readily see that for any country to successfully undertake this class of trade, it must be within, say, three weeks of its market, the remainder of the time being occupied in assembling shipments and in the disposal of same at the other end.

Great Britain offers the best and most important meat market in the world, one free from extreme fluctuations and too large to be easily influenced by the operations of interested individuals or firms. It is the market of all others in which every country producing a surplus endeavours to obtain a footing.

For countries so far away from this market as Australia and New Zealand it is impossible to market their meat other than in a hard frozen condition. Many attempts were made from Australia years ago, when I was in the business in that country, but they all ended in failure, the temperature having to be lowered to below freezing point to allow of its arrival in a saleable condition at all. Until quite recently, therefore, this method of exporting in a chilled state was confined entirely to the United States and other countries within easy reach of the British market.

Of late years a method known as the Linley process has been in use, and it is claimed that by it meat can be held above freezing point for a much longer period. This process, however, requires the use of a preservative. Formaline is vapourized and blown into the room or chamber in which the meat is hanging and forms a thin coating on the meat. In connection with the process there is a tank containing sulphuric acid in which thin leaden discs are slowly revolving, half submerged. The air is drawn from the chamber containing the meat and passes between these discs and is returned in a purified condition to the chamber. This operation is carried out at the least once prior to the loading of the meat on board ship, and at intervals of about a week during the voyage. Cargoes are being carried in a chilled state with the aid of this process from the Argentine, and I had a letter some time ago from Mr. Linley (whom I knew very well in Australia years ago), saying that arrangements were being made to ship a cargo from New Zealand, which would mean about seven weeks on the journey. I question, however, if the process will ever become a very great commercial success. One thing is certain, that meat treated and exported in this manner will not command anything like as good a price as a similar article chilled and marketed in the ordinary way without the aid of a preservative. It is quite possible it may bring a price midway between the frozen and chilled article, but whether this will prove sufficient to warrant the extra expense remains to be seen and can only be proved by experience.

You may naturally wonder why there should be all this fuss over a degree or two in temperature. The reason is, that choice beef handled and marketed in a chilled state is for all practical purposes equal to and even superior to much of the home-killed, and brings nearly as good a price, whereas the frozen article is greatly depreciated in quality owing to the lower temperatures breaking the meat cells, and the consequent dripping, drying and loss of the juices which takes place when thawing out. Mutton is affected to a less extent than beef, and lamb again less than mutton. For this reason the frozen article brings only about half the price of the same article marketed in a first-class chilled condition, the frozen article having to cater to a totally different class of trade. You will, therefore, readily see what an enormous advantage any country has which can market its meat in a chilled state and without the aid of any preservative.

The Dominion of Canada is in that very enviable position, and I may say that this country is the only portion of the empire, capable of producing meat animals in excess of requirements, which is able to export its meat to Great Britain in a chilled state. Just think what that means to a country such as this which is so admirably

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adapted for the production and finishing of all kinds of meat animals, yet this is the only country of importance in the world which has not a modern and scientific system of marketing same.

In the exporting of meat in a chilled state from this Dominion, it is not, therefore, a question of entering into competition on the British market with Australia and New Zealand. Such would be an exceedingly difficult task for us to undertake, for I have lived in those countries and know how cheaply meat animals can be produced in good seasons, and how impossible it would be for us to compete on an equal footing. Fortunately for us it is not necessary to do so, as we should receive on the British market for our chilled meat practically double what those countries receive for a similar quality of meat, marketed in a frozen state.

This morning Mr. McLean gave us an account of his firm's experience with the exporting of chilled beef, and in doing so made rather a sweeping statement to the effect that he did not think the business could be made a success.

I may say, that some three years ago, Mr. McLean very kindly allowed me to see the figures relating to these trial shipments. As far as I remember, they consisted of a car a week extending over some few months, were exported through United States channels, and only brought between 7 and 8 cents per pound on the market in Great Britain.

Now, as the average price for first-class quality chilled beef was at that time about 10 cents per pound, it is obvious there must have been something wrong with these shipments, either in the quality, get up, or condition upon arrival, or perhaps our friends to the south, not being keenly desirous of seeing the business successfully established in this country, and knowing the small amount of capital at the back of the enterprise, may have decided to kill it from the very start. However, whatever the reason (and there certainly must have been some reason for its bringing so low a price), it was surely possible to locate it, and had this been done and the cause removed, the results would in all probability have ended in success instead of failure.

Mr. McLean in his address gave some good sound advice and preached the gospel of persistency as playing a most important part in the success of any kind of business. It is, however, quite obvious, that at the time his firm made this small and very incomplete trial with chilled beef, that they were not then practising what he is now preaching.

For years past speakers have advocated the export of meat in a chilled state as a method of improving the live stock industry, and their sentiments have been applauded by their listeners, but little has been done to place the matter on a practical footing, owing to lack of assistance on the part of the government, and the impossibility of inaugurating and developing the industry on a sound and permanent basis without such help.

Some four years ago, during the time of the Dominion Fair in Calgary, at a meeting of ranchers and farmers, and presided over by Mr. Findlay, who was at that time Minister of Agriculture for Alberta, a committee was formed to collect data and information, and report to the Dominion Minister of Agriculture upon the desirability of establishing an organized system of meat exporting. The report of the committee (of which I had the honour of being a member) was printed by the Alberta government, this being a copy, and just three years ago it was presented to Mr. Fisher together with resolutions from agricultural and other societies representing over 20,000 farmers, urging the Minister to take the matter in hand and place the business on a workable basis as speedily as possible. In addition to which twenty out of the twenty-four members in the Dominion House from the province of Manitoba, Saskatchewan and Alberta, signed a strong memorandum to the Minister imploring him to take the matter up and render the necessary assistance towards establishing the industry, and at the same time pledging their support to the government in the granting of assistance financially or otherwise. The Minister was also provided with

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figures showing the approximate cost of the necessary works, plant and rolling stock, and details of the cost of operating from the purchasing of the animals to their sale in Great Britain, including slaughtering and treatment of by-products, chilling, railing, icing of cars, ocean freight, insurance, storage, handling and sale in Great Britain. These figures clearly showed that taking the average price of the previous ten years for chilled meat on the British market, with the present excessive rates of freight and other charges (which would be materially reduced as soon as the business was well under way and any quantity going forward), and after allowing interest and depreciation, the business could afford to give about 5 cents per pound live weight for choice, well-finished steers and 6 cents for hogs at furthest western points, and proportionately higher nearer east corresponding with the saving of freight.

Many of you, no doubt, received copies of this report at the time, but for the benefit of those who have not had an opportunity of reading same, I may say that it showed pretty conclusively the necessity existing for a modern and scientific system of marketing the meat animals of the country, also the stable and remunerative market it would provide, and thus stimulate the production of meat animals and prove immensely beneficial to the whole Dominion. It pointed out the failure of existing methods to place the live stock industry on a sound and satisfactory basis, and also gave a brief review of the manner in which the industry had been established in other countries, of the assistance rendered by the various governments, of the immensely beneficial results which had followed its adoption, and of how it had steadily superseded the obsolete and antiquated method of marketing on the hoof. It included an examination as to how far the best methods of other countries could be applied to this Dominion, together with a short account of the early history of the industry, showing the difficulties encountered in establishing the trade, financial conditions of other countries, centralization, de-centralization, trusts and monopolies and other matters connected with the business. It clearly pointed out that to successfully build up an export trade in chilled meat it must be operated in conjunction with the whole packing-house industry. To divorce the two industries at this stage of the country's development would be just as sensible as a butcher starting in one of the small towns of the west and handling and selling only the products of one kind of animal. One must be in a position to treat to the best possible advantage every kind and quality of meat animal offering. At the commencement of operations, until many of the farmers were educated as to what constituted a finished animal, no doubt only a small percentage would be suitable for exporting in a chilled state, the balance would in part be used for the local trade, and the remainder worked up into the various forms of packing-house products.

The plan recommended for adoption by this country was in the nature of several large and complete establishments working in conjunction with a considerable number of smaller works or feeders, distributed as widely as possible throughout the stock-raising portions of the country. By adopting this method, the necessary capital would be distributed and employed to the best advantage, and an even balance maintained between excessive centralization on the one hand and too wide a distribution of independent works, resulting in a lack of cohesion, on the other. It would develop the industry on an equitable basis in all the various stock-raising districts, with the greatest benefit to the whole country, thus assisting to the fullest extent the agricultural and pastoral industries throughout the Dominion.

The large central establishments would be placed or located at suitable points of railway convergence, and would be complete in every detail for the handling and treating of every kind of meat animal and their by-products. They would draw some of their supplies of stock from the surrounding country and would also be largely supplied by the smaller works or feeders. These smaller works or feeders would be provided with the necessary appliances for the slaughtering, chilling of the carcass and the working up of certain of the by-products. They would be located in any district where

sufficient cattle and hogs were obtainable or likely to be forthcoming in the near future, thus providing a market at the very doors of the farmer, and allowing of the stock being slaughtered near their own pastures, thus obviating travelling long distances on the hoof, and the consequent knocking about, deterioration in quality and loss in weight inseparable from so doing. It simply means the most business-like and economical manner of treating the raw material on the spot, and the building up of the industry entirely in the interests of Canada and for the Canadians. These small works would be designed in such a way as to allow of their being added to and extended as the business grew, and each would form the nucleus of a complete packing plant and develop into it just as speedily as the particular districts proved themselves capable of supporting a larger establishment. They would then in turn, themselves, throw out feeders and obtain some of their supplies from this source, and so their capabilities and numbers would extend and multiply, until the whole country was covered with a net work of chilling and packing plants.

The method suggested for financing the undertaking was, briefly, that the government should guarantee three-quarters of the capital required, and thus allow of that portion of the money being obtained cheaply, which is absolutely essential to build up the industry in a sound and permanent manner. The aim and object of this business must be the providing of a profitable market for everything the farm can produce, rather than the paying of dividends. If our sole desire were centered upon the paying of dividends, you or I or anybody else would probably do what is being done largely in the country to-day, give a big price when there was precious little coming forward and take it out of the farmers when they had anything to offer; fill up our stores with cheap meat in the fall and sell it at a greatly increased price in the spring, and be in the position to dictate to the man who has had sufficient pluck to feed a few head through the winter, as to what price he shall be paid for his stock; but is that the manner in which to build up the live stock industry of this country? Certainly not; but it is the way to pay dividends. Cheap money is essential to build up the industry on proper lines and it can only be obtained by having the government's guarantee. The government would have excellent security in the works, plant and other assets of the organization. The balance of the capital required would only be entitled to a reasonable rate of interest, and after the interest on the capital invested had been paid, any further profits obtained from the manufacture and marketing of the finished products would be divided between the unsecured shareholder and the producer of the stock *pro rata* to value of stock sold to organization, thus introducing the co-operative principle. As the producer, in addition to obtaining the highest market price for his stock, would further participate in all profits after a reasonable interest had been paid, he would thus, without putting any money into it, be given an interest in the concern, and would be obtaining his fair share in the benefits to be derived from the establishment and development of the industry. A certain measure of government control was recommended so that the interests of the producer would be protected for all time. In whatever manner it is decided to finance and operate the business, I maintain it must be in such a way as to obtain the confidence of the man who could and would produce if it were certain to be worth his while. A man is of little use to the country when he is only growing a few cattle and hogs just because he is obliged to, to live. By the establishment of this industry we want to stimulate production to such an extent that every one will be turning off his place the maximum number his particular ranch or farm is capable of producing. Price alone will not accomplish this, it can only be achieved by having some form of co-operation between the industry and the producer.

The only thing which can put new life and vigour into the live stock industry is a steady and profitable market, and the only means of obtaining this is by the establishment of a thoroughly organized chilling and packing-house industry, developed on sound business-like lines, under the control of the government, and with the producer properly protected.

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Another point which I may perhaps touch upon, and that is that to make this business an unqualified success, it will be necessary to have every link in the chain complete between the producer and the consumer in Great Britain. The estimate of cost, prepared by the Beef Commission, included not only the works but also suitable refrigerator cars and storage accommodation at the ports of shipment. This does not mean that this storage accommodation must be immediately provided, as no doubt, to commence with, arrangements could be made with existing concerns for a portion of their space, but provision must be made in the estimates for the actual owning of this important link in the chain of operations as soon as the business warrants it. The same applies to the sale of the meat in Great Britain. One must be in a position to go to the actual consumer with the goods. This was done by the States, and it is quite possible and even desirable that we should do the same, not at the very commencement of operations, but as soon as the business was well on its feet, and the amount being sent justified it. Think what a splendid advertisement it would mean for this country to have shops selling Canadian produce throughout Great Britain. As I pointed out to the late Minister of the Interior years ago, it would be a practical form of advertising, and would be worth far more than all the literature it was possible to publish and distribute. It would appeal in a most convincing manner to the very class of immigrant we are mostly in need of,—the small farmer with a little capital, who is essentially a lover of stock. At the present when one of this class of men thinks of leaving the old country for one or other of the less congested portions of the world, it is not to Canada he thinks of going, for the reason that he looks on this country as purely a grain country. He never sees Canadian meats. What cattle are shipped from this country are slaughtered at the port, and lose their identity as Canadian meat, whereas he daily sees the Australian, New Zealand and Argentine article exposed for sale, and naturally feels that a country which can produce such stock is good enough for him to make his home in. Place choice Canadian beef before him in a similar convincing manner and this country would gather in probably 75 per cent of these very desirable citizens who are now going to far more distant parts of the empire and other portions of the world.

Again, to have another outlet would be invaluable as a mere matter of insurance against the danger, always present, even if remote, of having the markets of every country closed to the imports of cattle from the Dominion should any infectious disease show itself in the herds of this country, and no country can afford to consider itself immune from such a contingency.

The establishment of this industry would be of enormous and far-reaching importance in the development of true and lasting agriculture. I know what it has done for other countries and have taken a leading part in the inauguration and development in those countries. One has only to look to the States, where conditions are somewhat similar, and where it has been of great importance in the building up of agriculture, even handicapped as it has been by the evils of the meat trust, to realize of how much greater worth would it be to this Dominion if established under the absolute control of the government and on the lines I have indicated. It would remove the black cloud which has been constantly darkening the farmers horizon for years past, and make his calling a far more certain and profitable one.

What is the position on the land to-day. There are hundreds doing little or nothing to produce anything, and there are again hundreds of others who are gambling in the growing of wheat, knowing full well that in many cases the odds are greatly against their obtaining a marketable crop. There is now no inducement to go into anything else, but provide these men with a certain profitable outlet for stock and a very different aspect will come over the scene. Those within easy reach of the works would quickly develop into finishers of stock, and those further removed, into breeders and growers of the stores. There would soon be thousands of both cattle and hogs produced where not one is forth-coming to-day, and agriculture would then

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be placed upon a true and permanent foundation. That is what we want to aim for in the establishment of this chilled meat trade, and which will do all this, and go far to fill the vacant places of this country with a prosperous and contented people.

Bold and vigorous measures are necessary not only to remedy the existing conditions and check the present languishing state of the live stock industry, but also to place this most important branch of agriculture on a sound and permanent footing for all time. The production and finishing of live stock is the very back bone of real and lasting agriculture, and agriculture is the main and permanent foundation upon which the future progress and prosperity of this country entirely depends; therefore, the placing of the live stock industry on a sound, profitable, and durable basis, is the most important problem claiming the immediate attention of the government at the present time.

This question of establishing a meat export trade received some attention at the last convention, but at that time no scheme of a practical nature had been placed before the Minister of Agriculture, and I gathered from the report of the convention that Mr. Fisher was of opinion that it was advisable to wait until greater numbers of well finished animals were forthcoming before embarking in the business. There can now be no possible doubt that the quality and quantity of stock required will never be forthcoming to any great extent until the market for same is assured. Given an outlet, such as the establishment of this industry on the sound lines suggested would provide, there would be no reason to fear lack of either numbers or quality. With the inauguration of this industry in the manner suggested, a big change will come over the scene. The rancher and farmer, no longer confined, restricted, and afraid to launch out, but at once assured of a steady and remunerative market for his stock, will embark in the business of producing with something approaching zest, and greater activity and consequent prosperity will be manifest on all sides. The future of the live stock industry under its stimulating influence is big with possibilities. The wonderful resources of the country from a meat-producing standpoint, so long neglected and practically unexploited, will be given scope, and will eventually and very rapidly become one of the country's greatest assets.

I believe at the last convention you were asked to guarantee the supply of a large number of stock towards the establishment of this industry. I maintain, and I speak with a thorough practical knowledge of the industry and what it has done towards building up the live stock business in every country in which it has been adopted, I say that guarantees to supply stock are useless, and in most cases not worth the paper they are written on. I have had experience of them, when I was in charge of the P. F. A. business in Australia years ago, which was the largest business of its kind in that country, and, as giving you some idea of its magnitude, I may say that in one year I handled over a million sheep besides large numbers of cattle, hogs and other refrigerated produce. At one time we were disposed to erect works in any centre where the farmers would guarantee 50,000 head of sheep or the equivalent in cattle, hogs or other goods, but we soon found that the best guarantee we could have that the necessary stock would be forthcoming, was the price to the producer, and the same applies to every country. The farmer is not going to provide the raw material unless it pays him to do so, and as long as conditions remain as they are, it is only a waste of time and energy to continue to exhort him to do so.

The whole question resolves itself into this, if through the establishment of this industry, a steady and profitable outlet can be obtained for every head of stock the country is capable of producing, then its establishment would be big and far-reaching in its effect on the live stock industry, and on the future progress and prosperity of the whole Dominion, and those responsible would have their names handed down to posterity as having achieved something of real and lasting good for true and permanent agriculture. On the other hand, if this business will not provide this profitable and steady outlet, sufficient to stimulate the production and finishing of great

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numbers of stock, then it is not worth touching, no, not even with a barge pole. I maintain, however, that the report of the Chilled Meat Committee is in itself sufficient to prove to any unbiased person, who will give the matter serious and intelligent consideration, that it will undoubtedly provide the market looked for, and prove of untold worth not only to the rancher and farmer, but to the whole Dominion.

What has been accomplished by other countries, and the States for example, can be accomplished by Canada. The States have been shipping for years past something like 30 million dollars worth of chilled beef alone to the British market, and I say there is nothing whatever to prevent this country building up in a very few years a trade of equal dimensions. There is only an imaginary line separating the two countries, and we on this side are just as capable of producing and finishing stock as they are on the other side, if we are given the opportunity. We have not their corn, but we have in our barley and oats, just as good, if not better food, and can produce it as cheaply as any country in the world, and its feeding value, even when frosted, is well illustrated by the experiments which have been made at the Government farm at Lacombe.

There is another matter I would like to touch upon for just a moment, and that is the relation of this industry to the present live cattle export trade and existing packing houses. Now, no one imagines for one moment that the establishment of this other outlet would kill the present live cattle export trade. That it would, however, provide a better and more satisfactory market is undeniable. As proof of this it is only necessary to again look at the States, where the business during the past twenty years has grown from nothing to about 30 million dollars worth per annum, whereas the live cattle exports have remained practically stationary during the same period. We have in this a very clear indication as to which method of exporting is considered the more satisfactory of the two in that country.

Many engaged in the export of live cattle, have been averse to seeing this industry established, fearing, no doubt, a curtailment of their own operations. Now, what is their position, if things continue much longer as at present,—they will soon have little or nothing at all to handle, and I maintain that the inauguration of this meat export trade will stimulate production to such an extent, that the heavy weight alone (which it may always pay to send alive) would outnumber those of all weights which are exported now. The same applies to the existing packing houses; they will participate in the increased production, and thus be able to keep their works running more continuously throughout the year, and later on, when the exporting of chilled meat is thoroughly organized and under way, they will be able to come into the business, without it having cost them one cent towards its establishment. The natural obstacles which beset the path leading to the establishment of his industry, are big enough, and ugly enough, without the creation of any artificial fences of any kind.

There are many other matters which I might touch upon, such as the effect of this business upon the building up within the Dominion of numerous subsidiary industries, which are dependent upon the packing house for their raw material, also the manner in which it would increase the earning powers of the railways and materially help towards paying the interest on the vast sums which have and are still being spent to develop the country. I feel, however, that I have already spoken at far too great a length, and in concluding I would just like to say that this modern and scientific method of marketing has been successfully adopted by every other country of importance in the world, and it is indispensable towards providing the necessary stability in the live stock industry within the Dominion. It is absolutely essential as a means of giving the required stimulus to the business of producing. It will make it worth the farmers while to take up the business with something approaching animation, and seriously embark on not only the production but also the finishing of their stock. The business of producing as existing at present is too precarious. The question of a modern, business-like and up-to-date meat export trade has become acute.

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No better incentive to produce and finish could be desired or given than the steady and profitable outlet this industry would provide, and under its influence we should soon be surprising the whole world with the capacity possessed by this country for the production of all kinds of meat animals.

The question, as I have always maintained, must be looked at very broadly, the difficulties we encounter, will, I feel confident, not prove insurmountable. It is well to remember that every great scheme seems at first impossible of accomplishment. Difficulties, however, when faced boldly have a way of disappearing. There must, however, be a readiness on all sides to put aside local interests and prejudices for the national well-being. Failure would be certain if the matter were approached in a narrow and petty spirit, and if the sole desire were centered upon securing something for one portion of the Dominion alone, although the immediate field for operations is undoubtedly the west. Success on the other hand is, I feel, assured, if the business is grasped in a bold and fearless manner, and established and built up on a sound, business-like and equitable foundation.

Already I see, in my mind's eye, the whole country dotted with chilling and packing plants, and the people on the land far more contented and prosperous, strenuously and intelligently working in the development of the immense natural resources of the land, and making this country not only the granary, but also the larder of Great Britain. It is an ideal worthy of a great effort, both on the part of the government and all those having the welfare of the country at heart, but let me tell you, gentlemen, it can only be attained by unity of purpose. We shall succeed just so far as we fix our eyes upon the ideal we have before us, and dismiss from our minds any petty jealousies and parochialisms which see no further than the province in which they reside. Let us all join forces and make this industry big and far-reaching for the live stock industry of the whole Dominion, and something worthy of accomplishment by any government for the lasting benefit of real and permanent agriculture.

MR. A. W. SMITH.—Mr. Chairman,—As chairman of the Resolutions Committee, I beg to submit for the consideration of the convention the following resolution: 'Moved by Robert Miller, seconded by Capt. T. Robson, that the words 'resident in Canada' be inserted in or added to the regulation now governing the importation of pure-bred animals into Canada.'

MR. ROBERT MILLER.—I will now move that this resolution be adopted by this convention.

(Motion seconded by Mr. Smith.)

COL. McCRAE.—Mr. Miller showed us that there were some Americans who were not residents of Canada and they had 'stool pigeons' in this country who acted for them. I think there is just as much need to stop that sort of thing as there is to prevent our fellow British subjects in England and Scotland sending horses to this country. In fact, I think there is more need of it. I really feel that there is as much need of stopping the 'stool pigeon' business as there is the other.

THE CHAIRMAN.—I am not supposed to give my views, but if I were allowed to it would be a hardship to me, because I have asked that horses be sent out to me from the old land and if this resolution was passed they would not come.

MR. MILLER.—Yes, they would. You would be the importer.

(Motion put to the meeting and carried.)

DR. RUTHERFORD.—We have with us Mr. A. W. Smith, whose name is down for a paper on 'Live Stock Registration.' Mr. Smith does not desire to read his paper because he knows you are tired and that the audience is getting small, and I wish to

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move that Mr. Smith's paper be printed as part of the proceedings of this convention and embodied in this report.

(Motion seconded by Dr. English, of Hamilton, and carried.)

Dr. RUTHERFORD.—I am informed by the new president that he thinks it is most essential that the members of the Executive Committee should hold a meeting to-morrow. We have only had two days at this convention and many of you have come a very great distance. We have got through a great deal of work, but we have not done all that ought to have been done.

Mr. ANDREW GRAHAM.—I do not know that I have anything to say in addition to what has been said. It is thought best to have a directors' meeting to-morrow.

Mr. ROBERT MILLER.—I would like to move a vote of thanks to the chairman who has presided so well at this meeting. He always does things well and we want him to retire knowing that he has the good-will of everybody and we all appreciate the work he has done.

Capt. ROBSON.—I have very much pleasure in seconding that motion. I must congratulate the president on the very nice address he gave us. It was short and right to the point.

(Motion put to the meeting and carried with applause.)

Mr. ANDREW GRAHAM.—I have very much pleasure in conveying to you, sir, this hearty vote of thanks for the able way in which you have presided at our meetings.

Mr. ROBERT NESS.—I thank you very much for the kind way in which you have shown your sympathy to me, knowing my shortcomings have been many, but my intentions were good and if I failed it was not for want of trying. I thank you very much for your kindness at this time and bid you Godspeed.

Convention closed.

APPENDIX No. 22.

SEVENTH ANNUAL REPORT OF THE RECORD COMMITTEE TO THE
RECORD BOARD AND RECORD ASSOCIATIONS.

RECORD COMMITTEE, 1911-1912.

A. W. Smith, Maple Lodge, Ont., Chairman.
 John Bright, Myrtle Station, Ont., Representing Heavy Horses.
 W. J. Starr, Toronto, Ont., Representing Light Horses.
 Robert Miller, Stouffville, Ont., Representing Beef Cattle.
 Hon. N. Garneau, Quebec, Que., Representing Dairy Cattle.
 J. M. Gardhouse, Weston, Ont., Representing Sheep.
 J. E. Brethour, Burford, Ont., Representing Swine.
 John W. Brant, Ottawa, Ont., Secretary-Treasurer.

Containing the financial statement of the Record Committee for the year 1911, a statement of the transactions and financial statement for each individual Association, and other general information.

FINANCIAL STATEMENT.

FOR THE YEAR ENDING DECEMBER 31st, 1911.

Receipts.

	\$ cts.	\$ cts.
Balance on hand December 31st, 1910.....		3,631 74
Dominion Government Grant, 1911		7,000 00
Dominion Swine Breeders' Association—		
Levy for salaries, 1911.....	1,200 00	
Adjustment of charges, 1910.....	114 80	
Overcharge on salaries, 1910.....	27 50	1,342 30
Dominion Sheep Breeders' Association—		
Adjustment of charges, 1910.....	525 99	525 99
Dominion Shorthorn Breeders' Association—		
Levy for salaries, 1911.....	3,219 96	
Levy for refunds, 1911.....	480 00	3,729 96
Canadian Ayrshire Breeders' Association—		
Levy for salaries, 1911.....	600 00	600 00
Canadian Hereford Breeders' Association—		
Levy for salaries, 1911.....	360 00	360 00
Canadian Jersey Cattle Club—		
Adjustment of charges, 1910.....	196 45	196 45
North American Galloway Association—		
Adjustment of charges, 1910.....	20 75	20 75
Canadian Aberdeen Angus Association—		
Adjustment of charges, 1910.....	186 93	186 93
French Canadian Cattle Breeders' Association—		
Adjustment of charges, 1910.....	88 19	88 19
Canadian Red-Polled Association—		
Adjustment of charges, 1910.....	40 07	40 07
Clydesdale Horse Association of Canada—		
Levy for salaries, 1911.....	2,389 00	
Levy for refunds, 1911.....	480 00	
Adjustment of charges, 1910.....	1,082 96	3,942 96
Canadian Shire Horse Association—		
Adjustment of charges, 1910.....	61 39	61 39
Canadian Hackney Horse Society—		
Adjustment of charges, 1910.....	103 80	103 80
French Canadian Horse Breeders' Association—		
Adjustment of charges, 1910.....	59 02	59 02
Canadian Percheron Horse Breeders' Association—		
Adjustment of charges, 1910.....	345 26	345 26
Canadian Belgian Draught Horse Breeders' Association—		
Adjustment of charges, 1910.....	58 02	58 02
Canadian Thoroughbred Horse Society—		
Adjustment of charges, 1910.....	99 00	99 00
Canadian Pony Society—		
Adjustment of charges, 1910.....	29 19	29 19
Received for import certificates.....	1,622 87	1,622 87
Total		24,043 89

(Sgd.) JNO. W. BRANT,
Accountant.

(Sgd.) GEO. L. BLATCH, F.C.A.,
Auditor.

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RECORD BOARD, 1911-1912.

Representing Dominion Swine Breeders' Association.—Jos. E. Featherstone, Streetsville, Ont.; J. E. Brethour, Burford, Ont.

Dominion Sheep Breeders' Association.—Lt.-Col. D. McCrae, Guelph, Ont.; R. H. Harding, Thorndale, Ont.

Dominion Shorthorn Breeders' Association.—Robert Miller, Stouffville, Ont.; A. W. Smith, Maple Lodge, Ont.; J. M. Gardhouse, Weston, Ont.; W. G. Pettit, Freeman, Ont.; H. Smith, Exeter, Ont.; W. A. Dryden, Brooklin, Ont.; Peter White, Pembroke, Ont.

Dominion Ayrshire Breeders' Association.—W. W. Ballantyne, Stratford, Ont.; W. F. Stephen, Huntingdon, Que.

Canadian Hereford Breeders' Association.—H. D. Smith, Hamilton, Ont.; R. J. Mackie, Oshawa, Ont.

Canadian Jersey Cattle Club.—R. Reid, Berlin, Ont.; L. J. C. Bull, Brampton, Ont.

North American Galloway Association.—Robt. Shaw, Brantford, Ont.; Lt.-Col. D. McCrae, Guelph, Ont.

Canadian Aberdeen Angus Association.—James Bowman, Guelph, Ont.; F. J. Collyer, Welwyn, Sask.

Canadian Guernsey Breeders' Association.—D. J. Mackay, Heath Bell, N.S.; H. W. Corning, Cheggogin, N.S.

French Canadian Cattle Breeders' Association.—Arsene Denis, St. Norbert, Que.; T. B. Macaulay, Montreal, Que.; Hon. N. Garneau, Quebec, Que.

Canadian Red-Polled Association.—W. J. McComb, Beresford, Man.; Dr. A. W. Bell, Winnipeg, Man.

Clydesdale Horse Association of Canada.—Jno. Bright, Myrtle Station, Ont.; Robt. Graham, Bedford Park, Ont.; Wm. Smith, Columbus, Ont.; Jno. A. Boag, Queensville, Ont.; Peter Christie, Manchester, Ont.

Canadian Shire Horse Association.—James Henderson, Belton, Ont.; John Gardhouse, Highfield, Ont.

Canadian Hackney Horse Society.—W. C. Renfrew, Bedford Park, Ont.; T. A. Graham, Claremont, Ont.

French Canadian Horse Breeders' Association.—Robt. Ness, Howick, Que.; J. A. Couture, Quebec, Que.; Arsene Denis, St. Norbert, Que.

Canadian Percheron Horse Breeders' Association.—Geo. Lane, Calgary, Alta.; R. P. Stanley, Moosomin, Sask.

Canadian Belgian Draught Horse Breeders' Association.—Paul Tourigny, Victoria-ville, Que.; J. Arthur Paquette, Quebec, Que.

Canadian Standard Bred Horse Society.—J. Wesley Allison, Morrisburg, Ont.; Geo. Pepper, Toronto, Ont.

Canadian Thoroughbred Horse Society.—Wm. Hendrie, Hamilton, Ont.; R. W. Davies, Todmorden, Ont.

Canadian Pony Society.—W. J. Stark, Toronto, Ont.; A. E. Major, Whitevale, Ont.

Canadian Suffolk Horse Society.—J. A. W. Fraser, Cochrane, Alta.; Norman Jaques, Ingleton, Alta.

Canadian French Coach Horse Society.—J. E. Goddard, Cochrane, Alta.; C. R. de la Vergne, Glenbow, Alta.

CANADIAN RECORD ASSOCIATIONS.

NAME OF ASSOCIATION.

Dominion Swine Breeders' Association.—A. P. Westervelt, secretary, Parliament Buildings, Toronto, Ont.

Dominion Sheep Breeders' Association.—A. P. Westervelt, secretary, Parliament Buildings, Toronto, Ont.

Dominion Shorthorn Breeders' Association.—W. G. Pettit, secretary, Freeman, Ont.

Canadian Ayrshire Breeders' Association.—W. F. Stephen, secretary, Huntingdon, Ont.

Canadian Hereford Breeders' Association.—R. J. Mackie, secretary, Oshawa, Ont.

Canadian Jersey Cattle Club.—R. Reid, secretary, Berlin, Ont.

North American Galloway Association.—Lieut.-Col. D. McCrae, secretary, Guelph, Ont.

Canadian Aberdeen Angus Association.—W. I. Smale, secretary, Brandon, Man.

Canadian Guernsey Breeders' Association.—H. W. Corning, secretary, Cheggogin, N.S.

French Canadian Cattle Breeders' Association.—J. A. Couture, D.V.S., secretary, 49 Garden St., Quebec, Que.

Canadian Red-Polled Association.—Dr. A. W. Bell, secretary, 160 Princess St., Winnipeg, Man.

Clydesdale Horse Association of Canada.—J. W. Sangster, secretary, 12 Wellington St. E., Toronto, Ont.

Canadian Shire Horse Association.—G. de W. Green, secretary, 58 Grenville St., Toronto, Ont.

Canadian Hackney Horse Society.—H. M. Robinson, secretary, 49 Colborne St., Toronto, Ont.

French Canadian Horse Breeders' Association.—Dr. J. A. Couture, D.V.S., secretary, 49 Garden St., Quebec, Que.

Canadian Percheron Horse Breeders' Association.—F. R. Pike, secretary, High River, Alta.

Canadian Belgian Draught Horse Breeders' Association.—J. A. Paquette, secretary, Department of Agriculture, Quebec, Que.

Canadian Standard Bred Horse Society.—Jno W. Brant, secretary, Ottawa, Ont.

Canadian Thoroughbred Horse Society.—J. J. Dixon, secretary, King and Jordan St., Toronto, Ont.

Canadian Pony Society.—W. J. Stark, secretary, 12 Wellington St. E., Toronto, Ont.

Canadian Suffolk Horse Society.—Arch. Jaques, secretary, Lamerton, Alta.

Canadian French Coach-Horse Breeders' Association.—E. L. Richardson, secretary, Calgary, Alta.

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Expenditures.

Dominion Shorthorn Breeders' Association—		
Adjustment of charges, 1910.....		\$ 624 19
Canadian Ayrshire Breeders' Association—		
Adjustment of charges, 1910.....		87 99
Canadian Hereford Breeders' Association—		
Adjustment of charges, 1910.....		159 07
Audit, Geo. L. Blatch.....		100 00
Refund of excess of fees.....		1,166 74
Expenses of Record Committee.....		503 43
Petty Expenses.....		108 51
Insurance.....		41 67
Printing.....		232 00
Telephone and Telegraph.....		68 25
Salaries in Record Office:—		
Jno. W. Brant.....	\$2,500 00	
R. G. T. Hitchman.....	1,500 00	
H. E. Martinette.....	1,625 00	
E. J. Bartlett.....	1,300 00	
A. R. Dawson.....	900 00	
C. Murray.....	625 00	
S. Kennedy.....	800 00	
R. J. Allen.....	800 00	
H. Patterson.....	339 00	
I. Larose.....	650 00	
A. M. Day.....	650 00	
I. B. Moodie.....	433 33	
N. E. Moodie.....	550 00	
R. E. LeGendre.....	450 00	
D. M. Milroy.....	180 00	
E. M. Battle.....	325 00	
A. M. Gunderson.....	450 00	
I. Lemoine.....	350 00	
A. V. Roy.....	205 00	
A. A. Duncan.....	96 00	
J. A. Robson.....	390 00	
Temporary Assistance.....	119 05	
Owing from 1910.....	27 50	15,264 33
		\$18,406 77
Balance in Bank December 31st, 1911.....		5,627 12
Office Cash.....		10 00
		\$24,043 89

(Sgd.) JNO. W. BRANT,
Accountant.

(Sgd) GEO. L. BLATCH, F.C.A.,
Auditor.

DOMINION SWINE BREEDERS' ASSOCIATION.

Organized 1889. Incorporated under Ontario Agricultural and Arts Act, 1895. Incorporated at Ottawa, July 31st, 1905. Head Office, Toronto, Ont.

OFFICERS FOR 1911.

President..... William Jones, Zenda, Ont.
Vice-President..... George Douglass, Mitchell, Ont.
Secretary-Treasurer..... A. P. Westervelt, Toronto, Ont.

DIRECTORS.

S. Dolson, Norval, Ont.
J. E. Brethour, Burford, Ont.
D. DeCoursey, Bornholm, Ont.
W. M. Smith, Scotland, Ont.
A. C. Hallman, Breslau, Ont.
Joseph Featherston, Streetsville, Ont.
James O'Neil, Birr, Ont.
Prof. G. R. Day, Guelph, Ont.
John Flatt, Millgrove, Ont.

Membership 1911, 573.
Herd Books published, Volumes 1 to 22 inclusive.

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REGISTRATIONS, TRANSFERS, ETC., 1911.

Registrations.	Transfers.	Dup. & New Certificates	Membership Rec.
7,136	732	40	\$1,090 00

DISTRIBUTION BY PROVINCES.

	Registrations.	Transfers.	Dup. & New Certificates.	Membership received.
				\$
Ontario	3,210	333	22	398 00
Manitoba	945	89	5	114 00
Saskatchewan	357	34	3	60 00
Alberta	525	62	2	162 00
British Columbia	179	31	1	36 00
Quebec	1,566	160	6	306 00
New Brunswick	159	11	1	24 00
Nova Scotia	78	5		22 00
Prince Edward Island	99	3		20 00
United States	18	4		8 00

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Dominion Swine Breeders' Association.

January 1st to December 31st, 1911.

For registrations and memberships	\$5,330 45
Interest	126 25
Credits outstanding, \$101.55.	\$5,456 70

RECEIPTS AND EXPENDITURES.

FOR CONDUCTING SWINE RECORD.

Receipts.

Received from Association to pay Salaries, 1911	\$1,260 00
From Record Committee Fund	423 81
Balance owing to Record Committee by Association	113 47
Error in Charges, 1910	27 50

1,764 78

Expenditures.

Salaries to December 31st, 1911	\$1,651 85
Refunds to December 31st, 1911	102 37
Audit to December 31st, 1911	10 56

\$1,764 78

(Sgd.) JNO. W. BRANT,

Accountant.

(Sgd.) GEO. L. BLATCH, F.C.A.,

Auditor.

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DOMINION SHEEP BREEDERS' ASSOCIATION.

Incorporated October 25th, 1905. Head Office, Toronto, Ont.

OFFICERS FOR 1911.

President.....Lt.-Col. D. McCrae, Guelph, Ont.
 Vice-President.....J. E. Cousins, Harriston, Ont.
 Secretary-Treasurer.....A. P. Westervelt, Toronto, Ont.

DIRECTORS.

John Rawlings, Forest, Ont.....R. H. Harding, Thorndale, Ont.
 James Snell, Clinton, Ont.....John Kelly, Shakespeare, Ont.
 L. Parkinson, Eramosa, Ont.....Prof. G. E. Day, Guelph, Ont.
 J. A. Cerswell, Bond Head, Ont.....John Campbell, Woodville, Ont.
 W. A. Dryden, Brooklin, Ont.....Andrew Whitelaw, Guelph, Ont.
 John Jackson, Abingdon, Ont.
 Membership 1911, 815.
 Flock Books published, Volumes 1 and 2.

REGISTRATIONS, TRANSFERS, ETC., 1911.

Registrations.	Transfers.	Dup. & New Certificates.	Membership Rec.
2,856	664	17	\$310.00

DISTRIBUTION BY PROVINCES.

	Registrations.	Transfers.	Dup. & New Certificates.	Membership Rec.
				\$
Ontario.....	1,329	66	1	96 00
Manitoba.....	174	28		16 00
Saskatchewan.....	72	83		7 00
Alberta.....	145	37		9 00
British Columbia.....	49	26		6 00
Quebec.....	957	401	5	160 00
New Brunswick.....	30	2	2	5 00
Nova Scotia.....	21			1 00
Prince Edward Island.....	18	5		2 00
United States.....	61	16	9	8 00

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Dominion Sheep Breeders' Association.

January 1st to December 31st, 1911.

For registrations and memberships.....	\$2,161 65
Interest.....	52 60
Credits outstanding, \$102.20.	\$2,214 25

RECEIPTS AND EXPENDITURES.

FOR CONDUCTING SHEEP RECORD.

RECEIPTS.

From Record Committee Fund.....	\$192 73
Balance owing to Record Committee by Association.....	649 78

\$842 51

EXPENDITURES.

Salaries to December 31st, 1911.....	\$779 44
Refunds to December 31st, 1911.....	58 75
Audit to December 31st, 1911.....	4 32

\$842 51

(Sgd.) JNO. W. BRANT,
Accountant.

(Sgd.) GEO. L. BLATCH, F.C.A.,
Auditor.

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DOMINION SHORTHORN BREEDERS' ASSOCIATION.

Organized January 12th, 1886 (amalgamation of Canada and British North American Herd Book Associations). Incorporated under Ontario Agricultural and Arts Act, 1887.
Incorporated at Ottawa, January, 1901. Head Office, Toronto, Ont.

OFFICERS FOR 1911.

President.....	Peter White, K. C., Pembroke, Ont.
Vice-President.....	Harry Smith, Exeter, Ont.
Second Vice-President.....	P. M. Bredt, Regina, Sask.
Secretary-Treasurer.....	W. G. Pettit, Freeman, Ont.

DIRECTORS.

William Smith, M.P., Columbus, Ont.....	J. M. Gardhouse, Weston, Ont.
J. G. Barron, Carberry, Man.....	A. Edward Myer, Guelph, Ont.
J. F. Mitchell, Burlington, Ont.....	John Gardhouse, Highfield, Ont.
J. G. Washington, Ninga, Man.....	J. T. Gibson, Denfield, Ont.
John Isaac, Markham, Ont.....	J. A. Watt, Salem, Ont.
W. A. Dryden, Brooklin, Ont.....	James Leask, Greenbank, Ont.
W. D. Cargill, Cargill, Ont.....	C. A. Archibald, Truro, N.S.
S. Dymont, Barrie, Ont.	

Membership 1911, 2,056. Herd Books published, Volumes 1 to 23 inclusive.

REGISTRATIONS, TRANSFERS, ETC., 1911.

Registrations.	Transfers.	Dup. & New Certificates.	Membership Rec.
7,430	2,639	230	\$3,082 00

DISTRIBUTION BY PROVINCES.

—	Registrations.	Transfers.	Dup. & New Certificates.	Membership Rec.
				\$
Ontario.....	4,742	1,541	114	2,054 00
Manitoba.....	1,061	353	41	474 00
Saskatchewan.....	454	239	29	156 00
Alberta.....	535	322	34	214 00
British Columbia.....	14	11	1	22 00
Quebec.....	279	81	9	92 00
New Brunswick.....	45	21	.....	20 00
Nova Scotia.....	119	63	.....	42 00
Prince Edward Island.....	30	6	1	6 00
United States.....	151	2	1	2 00

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Dominion Shorthorn Breeders' Association.

January 1st to December 31st, 1911.

For registrations and memberships.....	\$11,093 54
For Herd Books.....	14 00
From W. G. Pettit for deposit.....	624 19
Interest.....	133 85
Credits outstanding, \$311.90.	\$11,865 58

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RECEIPTS AND EXPENDITURES.

FOR CONDUCTING SHORTHORN RECORD.

RECEIPTS.

Received from Association to pay Salaries, 1911.....	\$3,249 96
Received from Association to pay Refunds, 1911	489 00
From Record Committee Fund.....	651 64
	<hr/>
	\$4,381 60

EXPENDITURES.

Salaries to December 31st, 1911.....	\$3,576 74
Refunds to December 31st, 1911.....	291 32
Audit to December 31st, 1911.....	23 21
Insurance.....	14 62
Balance owing to Association by Record Committee.....	475 21
	<hr/>
	\$4,381 60

*136 Registrations were Ancestors.

(Sgd.) JNO. W. BRANT.

Accountant.

(Sgd.) GEO. L. BLATCH, F.C.A.,

Auditor.

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CANADIAN AYRSHIRE BREEDERS' ASSOCIATION.

Organized March 10th, 1898, by amalgamation of the Canadian Ayrshire Breeders and Importers' Association established 1870 and the Dominion Ayrshire Breeders' Association established 1872. Incorporated under Ontario Agricultural and Arts Act.

Incorporated at Ottawa, Ont., 1905. Head Office, Huntingdon, Que.

OFFICERS AND DIRECTORS 1911.

Hon. President.....Dr. J. G. Rutherford, Ottawa, Ont.
 President.....John McKee, Norwich, Ont.
 Vice-President.....Hector Gordon, Howick, Que.
 Secretary-Treasurer.....W. F. Stephen, Huntingdon, Que.

DIRECTORS.

WESTERN :
 A. Hume, Menie, Ont.
 John McKee, Norwich, Ont.
 W. W. Ballantyne, Stratford, Ont.
 Robert Hunter, Maxville, Ont.
 A. Kains, Byron, Ont.
 William Stewart, Menie, Ont.
 N. Dymont, Clappison's Cors., Ont.

EASTERN :
 R. R. Ness, Howick, Qua.
 Hon. Wm. Owens, Montreal, Que.
 N. Lachapelle, St. Paul l'Ermite, Que.
 James Bryson, Brysonville, Que.
 Hector Gordon, Howick, Que.
 P. D. McArthur, N. Georgetown, Que.
 G. C. P. McIntyre, Sussex, N.B.

Membership 1911, 781.

Herd Books published, 21 (Canada 5, Dominion 3, Canadian 13).

REGISTRATIONS, TRANSFERS, ETC., 1911.

Registrations.	Transfers.	Dup. & New Certificates.	Membership Rec.
2,833	1,254	49	\$834 00

DISTRIBUTION BY PROVINCES.

	Registrations.	Transfers.	Dup. & New Certificates.	Membership Rec.
				\$
Ontario.....	1,063	485	12	304 00
Manitoba.....	51	28	1	22 00
Saskatchewan.....	18	9	.....	10 00
Alberta.....	87	66	2	42 00
British Columbia.....	54	18	3	14 00
Quebec.....	1,331	519	24	366 00
New Brunswick.....	120	51	1	30 00
Nova Scotia.....	80	56	.....	36 00
Prince Edward Island.....	24	20	.....	8 00
United States.....	5	2	6	2 00

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Canadian Ayrshire Breeders' Association.

January 1st to December 31st, 1911.

For registrations and memberships	\$4,766 30
For Herd Books.....	4 00
Interest.....	50 00
Credits outstanding, \$141.55.	\$4,820 30

SESSIONAL PAPER No. 15b

RECEIPTS AND EXPENDITURES.

FOR CONDUCTING AYRSHIRE RECORD.

Receipts.

Received from Association to pay Salaries, 1911.....	\$ 600 00
From Record Committee Fund.....	368 05
Balance owing to Record Committee by Association.....	181 66
	<hr/>
	\$1,149 71

Expenditures.

Salaries to December 31st, 1911	\$1,096 92
Refunds to December 31st, 1911	33 94
Audit to December 31st, 1911.....	9 54
Insurance.....	9 31
	<hr/>
	\$1,149 71

(Sgd.) JNO. W. BRANT,
Accountant.

(Sgd.) GEO. L. BLATCH, F.C.A.
Auditor

3 GEORGE V., A. 1913

CANADIAN HEREFORD BREEDERS' ASSOCIATION.

Incorporated 1905. Head Office, Oshawa, Ont.

OFFICERS FOR 1911.

President.....H. D. Smith, Hamilton, Ont.
 Vice-President.....L. O. Clifford, Oshawa, Ont.
 Secretary-Treasurer.....R. J. Mackie, Oshawa, Ont.

DIRECTORS.

W. H. Harrison, Mount Albert, Ont. A. S. Hunter, Durham, Ont.
 H. J. Reid, Epping, Ont. Asa Warnica, Painswick, Ont.
 T. B. Aitken, Teeswater, Ont. A. F. O'Neil, Southgate, Ont.
 Frank B. Harrison, Mount Albert, Ont. R. J. Penhall, Villa Nova, Ont.
 R. W. Stutt, Forest, Ont. Henry Reid, Mimosa, Ont.
 Alfred Stone, Guelph, Ont. William Gillies, Robb, Ont.

Membership 1911, 237.

Herd Books published, Volumes 1 to 16 inclusive.

REGISTRATIONS, TRANSFERS, ETC., 1911.

Registrations	Transfers.	Dup. & New Certificates.	Membership Rec.
*1,295	340	11	\$330 00

DISTRIBUTION BY PROVINCES.

	Registrations.	Transfers.	Dup. & New Certificates.	Membership Rec.
Ontario.....	420	172	5	\$170 00
Manitoba.....	186	47		80 00
Saskatchewan.....	309	61		32 00
Alberta.....	278	48	6	68 00
British Columbia.....	67	1		4 00
Quebec.....	9	10		4 00
Nova Scotia.....	8	1		4 00
United States.....	18			18 00

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Canadian Hereford Breeders' Association.

January 1st to December 31st, 1911.

For registrations and memberships.....	\$1,672 52
Interest.....	40 45
Credits outstanding, \$62.95.	\$1,712 97

RECEIPTS AND EXPENDITURES.

FOR CONDUCTING HEREFORD RECORD.

Receipts.

Received from Association to pay Salaries, 1911.....	\$ 360 00
From Record Committee Fund.....	148 54
	\$ 508 54

Expenditures.

Salaries to December 31st, 1911.....	\$ 442 81
Refunds to December 31st, 1911.....	8 58
Audit to December 31st, 1911.....	3 35
Balance owing to Association by Record Committee.....	47 81
Insurance.....	5 99

\$ 508 54

*459 Registrations were Ancestors.

(Sgd.) JNO. W. BRANT,

Accountant.

(Sgd.) GEO. L. BLATCH, F.C.A.,

Auditor.

SESSIONAL PAPER No. 15b

CANADIAN JERSEY CATTLE CLUB.

Organized June 15th, 1901. Incorporated February 11th, 1905.
Head Office, Toronto, Ont.

OFFICERS FOR 1911.

President.....David Duncan, Don, Ont.
Vice-Presidents—D. O. Bull, Toronto, Ont.; T. Porter, Toronto, Ont.; H. W. Edwards,
Coaticook, Que.; H. S. Pipes, Amherst, N.S.; W. V. Edwards, Souris, Man.
Secretary-Treasurer.....R. Reid, Berlin, Ont.

DIRECTORS.

F. L. Green, Greenwood, Ont. S. J. Lyons, Norval, Ont.
R. J. Fleming, Toronto, Ont. B. A. Bull, Brampton, Ont.
Membership 1911, 174.

REGISTRATIONS, TRANSFERS, ETC., 1911.

Registrations.	Transfers.	Dup. & New Certificates.	Membership Rec.
715	336	9	\$142 00

DISTRIBUTION BY PROVINCES.

—	Registration.	Transfers.	Dup. & New Certificates.	Membership Rec.
				\$ cts.
Ontario	460	244	6	83 00
Manitoba.....	31	11	.....	9 00
Saskatchewan	12	5	1	3 00
Alberta.....	22	15	.....	4 00
British Columbia.....	39	20	.....	11 00
Quebec.....	63	13	1	11 00
New Brunswick.....	49	13	.....	7 00
Nova Scotia.....	25	10	.....	11 00
Prince Edward Island.....	14	5	1	3 00

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Canadian Jersey Cattle Club.

January 1st to December 31st, 1911.

For registrations and memberships.....	\$1,130 93
Interest	29 50
Credits outstanding, \$51.85	\$1,160 43

RECEIPTS AND EXPENDITURES.

FOR CONDUCTING JERSEY RECORD.

Receipts.

From Record Committee Fund.....	\$ 97 32
Balance owing Record Committee by Jersey Club.....	02 39
	2
	\$ 299 71

Expenditures.

Salaries to December 31st, 1911.....	\$ 289 37
Refunds to December 31st, 1911.....	8 08
Audit to December 31st, 1911.....	2 26
	\$ 299 71

(Sgd.) JNO. W. BRANT,
Accountant.

(Sgd.) GEO. L. BLATCH, F.C.A.,
Auditor.

3 GEORGE V., A. 1913

NORTH AMERICAN GALLOWAY ASSOCIATION.

Organized November 24th, 1882. Incorporated, Ontario Agriculture and Arts Act, 1882.
Incorporated at Ottawa, Ont., 1905. Head Office, Guelph, Ont.

OFFICERS FOR 1911.

President..... Robert Shaw, Brantford, Ont.
Secretary-Treasurer..... Lt.-Col. D. McCrae, Guelph, Ont.
Executive Committee—H. D. Irwin, Markdale, Ont.; John B. Telfer, Milton, Ont., John
Duff, Rockwood, Ont.
Membership 1911, 16.
Herd Books published, Volume 1.

REGISTRATIONS, TRANSFERS, ETC., 1911.

Registrations.	Transfers.	Dup. & New Certificate.	Membership Rec.
38	6	.....	\$12 00

DISTRIBUTION BY PROVINCES.

—	Registrations.	Transfers.	Dup. & New Certificates.	Membership Rec.
				\$ cts.
Ontario.....	26	3	.....	3 00
Manitoba.....	4	.....	.....	6 00
Saskatchewan.....	2	1	.....	2 00
Alberta.....	6	2	.....	1 00

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the North American Galloway Association.

January 1st to December 31st, 1911.

For registrations and memberships	\$ 39 00
Interest.....	4 00
Credits outstanding, \$1.75.	\$ 43 00

RECEIPTS AND EXPENDITURES.

FOR CONDUCTING GALLOWAY RECORD.

Receipts.

From Record Committee Fund.....	\$ 4 43
Balance owing to Record Committee by Association.....	8 41
	\$ 12 84

Expenditures.

Salaries to December 31st, 1911	\$ 12 76
Audit to December 31st, 1911.....	0 08
	\$12 84

(Sgd.) JNO. W. BRANT,
Accountant.

(Sgd.) GEO. L. BLATCH, F.C.A.,
Auditor.

SESSIONAL PAPER No. 15b

CANADIAN ABERDEEN ANGUS ASSOCIATION.

Organized 1906. Incorporated May 4th, 1906. Head Office, Winnipeg, Man.

OFFICERS FOR 1911.

President..... J. D. McGregor, Brandon, Man.
 Vice-President..... James Bowman, Guelph, Ont.
 Secretary-Treasurer..... W. I. Smale, Brandon, Man.

Directors.

James Brown, Ellisboro, Sask. W. T. G. McClure, Innisfail, Alta.
 Hon. W. Clifford, Austin, Man. John Turner, Calgary, Alta.
 John Low, Elora, Ont.

Membership 1911, 152.

Herd Books published, Volumes 1 and 2.

REGISTRATIONS, TRANSFERS, ETC., 1911.

Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
*722	236	7	\$220 00

DISTRIBUTION BY PROVINCES.

	Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
Ontario.....	212	118	5	\$104 00
Manitoba.....	363	55		56 00
Saskatchewan.....	68	21	1	14 00
Alberta.....	110	30	1	38 00
British Columbia.....	7	2		2 00
Quebec.....	9	10		4 00
Prince Edward Island.....	3			2 00

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Canadian Aberdeen Angus Association.

January 1st to December 31st, 1911.

For registrations and memberships.....	\$1,331 35
Interest.....	45 90
Credits outstanding, \$22.75.	\$1,337 25

RECEIPTS AND EXPENDITURES.

FOR CONDUCTING ABERDEEN ANGUS RECORD.

Receipts.

From Record Committee Fund.....	\$ 91 00
Balance owing to Record Committee by Association.....	188 30
	279 30

Expenditures.

Salaries to December 31st, 1911.....	\$ 271 83
Refunds to December 31st, 1911.....	4 81
Audit to December 31st, 1911.....	2 66
	\$279 30

* 222 Registrations were Ancestors.

(Sgd.) JNO. W. BRANT,
Accountant.

(Sgd.) GEO. L. BLATCH, F.C.A.
Auditor

3 GEORGE V., A. 1913

CANADIAN GUERNSEY BREEDERS' ASSOCIATION.

Organized 1905. Incorporated November 20th, 1905. Head Office, Cheggogin, N.S.

OFFICERS FOR 1911.

Honorary President Hon. Sydney Fisher, Knowlton, Que.
 President..... D. G. MacKay, Heath, Bell, N.S.
 Vice-President..... E. J. Johnson, George's River, N.S.
 Secretary-Treasurer Howard W. Corning, Cheggogin, N.S.

Directors.

T. D. Bates, Mid Stewiacke, N.S. J. F. Roach, Sussex, N.B.
 J. F. Roper, Charlottetown, P.E.I. J. J. Gareau, St. Roch l'Achigan, Que.
 R. M. Jackson, Jacksonville, C.B.

Membership 1911, 38.

REGISTRATIONS, TRANSFERS, ETC., 1911.

Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
99	17	.....	\$15 00

DISTRIBUTION BY PROVINCES.

	Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
Ontario.....	9	.....	.....	\$ 1 00
Quebec.....	19	.....	.....	3 00
New Brunswick.....	13	1	.....	3 00
Nova Scotia.....	31	16	.....	7 00
Prince Edward Island.....	21	.....	.....	.....
United States.....	1	.....	.....	.....
British Columbia.....	5	.....	.....	1 00

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Canadian Guernsey Breeders' Association.

January 1st to December 31st, 1911.

For registrations and memberships.....\$ 132 75
 Interest..... 4 40
 Credits outstanding, \$3.65. \$137 15

RECEIPTS AND EXPENDITURES.

FOR CONDUCTING GUERNSEY RECORD.

Receipts.

From Record Committee Fund.....\$ 2 51
 Balance owing to Record Committee by Association..... 49 65
 \$52 16

Expenditures.

Salaries to December 31st, 1911.....\$ 8 52
 Refunds to December 31st, 1911..... 1 02
 Audit to December 31st, 1911..... 27
 Adjustment of charges, 1911..... 42 35
 \$72 16

(Sgd.) JNO. W. BRANT,
 Accountant.

(Sgd.) GEO. L. BLATCH, F.C.A.,
 Auditor.

SESSIONAL PAPER No. 15b

FRENCH CANADIAN CATTLE BREEDERS' ASSOCIATION.

Organized 1895. Incorporated November 20th, 1905. Head Office, Quebec, Que.

OFFICERS FOR 1911.

President.....Arsene Denis, St. Norbert Sta., Que.
 Vice-President.....T. B. Macaulay, Montreal, Que.
 Secretary-Treasurer.....Dr. J. A. Couture, Quebec, Que.

Directors.

Hon. N. Garneau, Quebec, Que. Ls. Thouin, Repentigny, Que.
 Joseph Coulombe, St. Norbert Gedeon Garceau, Pointe du Lac, Que.
 (Berthier), Que. Ls. P. Sylvestre, St. Theodore d'Acton, Que.

Membership 1911, 139.
 Herd Book published, Volume 1.

REGISTRATIONS, TRANSFERS, ETC., 1911.

Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
*325	115	5	\$100 09

DISTRIBUTION BY PROVINCES.

	Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
Ontario.....	15	3	.....	\$ 2 00
Quebec.....	308	110	5	97 00
United States.....	2	1	.....	1 00

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the French Canadian Cattle Breeders' Association.

January 1st to December 31st, 1911.

For registrations and memberships.....	\$439 70
Books sold.....	1 00
Interest.....	7 90
Credits outstanding, \$6.00.	\$448 60

RECEIPTS AND EXPENDITURES.

FOR CONDUCTING FRENCH CANADIAN CATTLE RECORD.

<i>Receipts.</i>	
From Record Committee Fund.....	\$ 14 96
Balance owing to Record Committee by Association.....	110 28
	\$125 24

<i>Expenditures.</i>	
Salaries to December 31st, 1911.....	\$123 34
Refunds to December 31st, 1911.....	1 02
Audit to December 31st, 1911.....	0 88
	\$125 24

* 47 Registrations were Ancestors.

(Sgd.) JNO. W. BRANT,
 Accountant.

(Sgd.) GEO. L. BLATCH, F.C.A.,
 Auditor.

3 GEORGE V., A. 1913

CANADIAN RED POLLED ASSOCIATION.

Organized 1905. Incorporated May 5th, 1906. Head Office, Winnipeg, Man.

OFFICERS FOR 1911.

President.....W. J. McComb, Beresford, Man.
 Vice-President.....H. V. Clendenning, Harding, Man.
 Secretary-Treasurer.....Dr. A. W. Bell, Winnipeg, Man.

Directors.

H. E. Waby, Enderby, B.C. J. M. Maynard, Chilliwack, B.C.
 Geo. Swales, Myrtle, Man. R. F. Harman, North Battleford, Sask.
 John H. Elliott, Irma, Alta.

Membership 1911, 18.

REGISTRATIONS, TRANSFERS, ETC., 1911.

Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
*145	22	.....	\$18 00

DISTRIBUTION BY PROVINCES.

	Registrations.	Transfers.	Dup and New Certificates.	Membership Rec.
Ontario.....	6	.....	.....
Manitoba.....	20	10	.....	\$8 00
Saskatchewan.....	2	.....	.....
Alberta.....	10	7	.....	2 00
British Columbia.....	107	5	.....	8 00

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Canadian Red Polled Association.

January 1st to December 31st, 1911.

For registrations and memberships.....	\$123 50
Interest.....	6 30
Credits outstanding, \$1.75.	\$129 80

RECEIPTS AND EXPENDITURES.

FOR CONDUCTING RED POLLED RECORD.

Receipts.

From Record Committee Fund.....	\$14 94
Balance owing to Record Committee by Association.....	27 66
	\$42 60

Expenditures.

Salaries to December 31st, 1911.....	\$42 35
Audit to December 31st, 1911.....	0 25
	\$42 60

* 91 Registrations were Ancestors.

(Sgd.) JNO. W. BRANT,
 Accountant.

(Sgd.) GEO. L. BLATCH, F C. A.
 Auditor.

SESSIONAL PAPER No. 15b

CLYDESDALE HORSE ASSOCIATION OF CANADA.

Organized 1883. Incorporated, Ontario Agriculture and Arts Act, 1886.
Incorporated at Ottawa, 1905. Head Office, Toronto, Ont.

OFFICERS FOR 1911.

President.....John Bright, Myrtle Station, Ont.
Vice-President.....Robert Graham, Bedford Park, Ont.
Secretary-Treasurer...J. W. Sangster, 12 Wellington St. E., Toronto, Ont.

Directors.

John A. Boag, Queensville, Ont. Wm. Smith, Columbus, Ont.
William Graham, Claremont, Ont. James Henderson, Belton, Ont.
James Torrance, Markham, Ont. T. H. Hassard, Markham, Ont.
A. G. Gormley, Unionville, Ont.

Membership, 1911, 1,750.
Stud Books published, Volumes 1 to 20 inclusive.
Index to Stallions, 18 Volumes.

REGISTRATIONS, TRANSFERS, ETC., 1911.

Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
*3864	2400	184	\$3,062 00

DISTRIBUTION BY PROVINCES.

	Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
Ontario.....	2,294	1,007	78	\$ 2,060 00
Manitoba.....	512	408	28	434 00
Saskatchewan.....	381	527	34	244 00
Alberta.....	347	243	25	148 00
British Columbia.....	65	56	4	34 00
Quebec.....	190	132	7	82 00
New Brunswick.....	31	5	5	14 00
Nova Scotia.....	13	11	1	24 00
Prince Edward Island.....	8	6	.....	14 00
United States.....	9	5	2	4 00
Scotland.....	14	.....	.....	4 00

Cash received at the National Record Office and deposited in the Imperial Bank to the Credit of the Clydesdale Horse Association of Canada.

January 1st to December 31st, 1911.

For registrations and memberships.....	\$ 13,281 35
For Stud Books.....	30 00
Interest.....	437 05
Credits outstanding, \$538.78.	\$ 13,748 40

3 GEORGE V., A. 1913

RECEIPTS AND EXPENDITURES.

FOR CONDUCTING CLYDESDALE RECORD.

Receipts.

Received from Association to pay Salaries, 1911.....	\$ 2,420 00
Received from Association to pay Refunds, 1911.....	440 00
From Record Committee Funds.....	220 26
	<hr/>
	\$ 3,080 26

Expenditures.

Salaries to December 31st, 1911.....	\$ 2,569 06
Refunds to December 31st, 1911.....	329 83
Audit to December 31st, 1911.....	26 28
Insurance.....	8 81
Balance owing to Association by Record Committee.....	146 23
	<hr/>
	\$ 3,080 26

* 184 Registrations were Ancestors.

(Sgd.) JNO. W. BRANT,
Accountant.(Sgd.) GEO. L. BLATCH, F.C.A.,
Auditor.

SESSIONAL PAPER No. 15b

CANADIAN SHIRE HORSE ASSOCIATION.

Organized 1888. Incorporated, Ontario Agriculture and Arts Act, 1839.

Incorporated at Ottawa, Ont., 1905. Head Office, Toronto, Ont.

OFFICERS FOR 1911.

President.....John Breckon, Appleby, Ont.
 Vice-President.....Andrew A. Miller, Middlemarch, Ont.
 Secretary-Treasurer.....G. de W. Green, 58 Grenville St., Toronto, Ont.

Directors.

C. E. Porter, Appleby, Ont. William Laking, Haliburton, Ont.
 John Gardhouse, Highfield, Ont. James Dalgety, Glencoe, Ont.
 J. M. Gardhouse, Weston, Ont. Darius York, Belhaven, Ont.
 James Henderson, Belton, Ont.

Membership 1911, 105.

Stud Books published, Volumes 1 and 2.

REGISTRATIONS, TRANSFERS, ETC., 1911.

Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
*150	71	3	\$138 00

DISTRIBUTION BY PROVINCES.

	Registration.	Transfers.	Dup. and New Certificates.	Membership Rec.
Ontario.....	89	17	1	\$ 96 00
Manitoba.....	20	9	1	18 00
Saskatchewan.....	18	12	1	10 00
Alberta.....	63	33	.....	12 00
British Columbia.....	.....	.....	.....	2 00

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Canadian Shire Horse Association.

January 1st to December 31st, 1911.

For registrations and memberships.....	\$ 468 92
Interest.....	20 00
Credits outstanding, \$5.55.	\$ 488 92

RECEIPTS AND EXPENDITURES.

FOR CONDUCTING SHIRE RECORD.

Receipts.

From Record Committee Funds.....	\$ 80 53
Balance owing to Record Committee by Association.....	100 49
	\$ 190 02

Expenditures.

Salaries to December 31st, 1911.....	\$ 163 39
Refunds to December 31st, 1911.....	24 22
Audit to December 31st, 1911.....	94
Insurance.....	1 47
	\$ 190 02

* 18 Registrations were Ancestors.

(Sgd.) JNO. W. BRANT,
 Accountant.

(Sgd.) GEO. L. BLATCH, F.C.A.,
 Auditor

3 GEORGE V., A. 1913

CANADIAN HACKNEY HORSE SOCIETY.

Organized February 2nd 1892. Incorporated, Ontario Agriculture and Arts Act. Incorporated at Ottawa, Ont., 1905. Head Office, Toronto, Ont.

OFFICERS FOR 1911.

President W. H. Gibson, Beaconsfield, Que.
Vice-President J. Wesley Allison, Morrisburg, Ont.

DIRECTORS

John A. Boag, Queensville, Ont. A. Yager, Simcoe, Ont.
E. Watson, Hudson Heights, Que. T. A. Cox, Brantford, Ont.
T. A. Graham, Claremont, Ont. T. D. Elliott, Bolton, Ont.
E. C. H. Tisdale, Beaverton, Ont.

Membership, 1911, 146.

Studs books published, Volumes 1 and 2.

REGISTRATIONS, TRANSFERS, ETC., 1911.

Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
*138	67	6	\$133.00

DISTRIBUTION BY PROVINCES.

	Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
Ontario	48	24	3	\$72 00
Manitoba	6	7		6 00
Saskatchewan	15	9	1	21 00
Alberta	25	11	1	15 00
British Columbia	15	7	1	12 00
Quebec	14	9		12 00
New Brunswick	1			
Nova Scotia	3			3 00
United States	11			12 00

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Canadian Hackney Horse Society.

January 1st to December 31st, 1911.

For registrations and memberships	\$662 70
For Stud Books	13 00
Interest	18 15
Credits outstanding, \$12.	\$693 85

RECEIPTS AND EXPENDITURES.

FOR CONDUCTING HACKNEY RECORD.

Receipts.

From Record Committee Funds	\$70 81
Balance owing to Record Committee by Society	76 27
	\$147 08

Expenditures.

Salaries to December 31st, 1911	\$128 23
Refunds to December 31st, 1911	16 03
Audit to December 31st, 1911	1 35
Insurance	1 47
	\$147 08

*5 Registrations were Ancestors.

(Sgd.) JNO. W. BRANT.
Accountant.

(Sgd.) GEO. L. BLATCH, F.C.A.
Auditor.

SESSIONAL PAPER No. 15b

FRENCH CANADIAN HORSE BREEDERS' ASSOCIATION.

Organized 1895.

Incorporated November 20th. 1905.

Head Office, Quebec, Que.

OFFICERS FOR 1911.

President.....Joseph Deland, L'Acadie, Que.
 Vice-President.....Robert Ness, Howick, Que.
 Secretary-Treasurer.....Dr. J. A. Couture, 49 Garden St., Quebec, Que.

DIRECTORS.

La. Lavallee, St. Guillaume, Que. La. P. Sylvestre, St. Theodore d'Acton, Que.
 Dr. J. H. Vigneau, Trois-Rivieres, Que. Gédéon Jarceau, Point du Lac, Que.
 W. P. Kearney, Montreal, Que. Horance Morin, St. Hyacinthe, Que.
 Arsène Denis, St. Norbert Sta., Que. James Bryson, Brysonville, Que.
 Membership, 1911, 127.

REGISTRATIONS, TRANSFERS, ETC., 1911.

Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
61	16	3	\$68.00

DISTRIBUTION BY PROVINCES.

	Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
Ontario.....		2		
Manitoba.....	4	1		\$ 1 00
Quebec.....	57	13	3	65 00
United States.....				2 00

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the French Canadian Horse Breeders' Association.

January 1st to December 31st, 1911.

For registrations and memberships.....	\$ 157 65
Interest.....	13 55
Credits outstanding, \$2.00.	\$171 20

RECEIPTS AND EXPENDITURES.

FOR CONDUCTING FRENCH CANADIAN HORSE RECORD.

Receipts.

From Record Committee Funds.....	\$ 4 09
Balance owing to Record Committee by Association.....	33 37
	\$37 46

Expenditures.

Salaries to December 31st, 1911.....	\$33 68
Refunds to December 31st, 1911.....	3 56
Audit to December 31st, 1911.....	22
	\$37 46

(Sgd.) JNO. W. BRANT,
Accountant.

(Sgd.) GEO. L. BLATCH, F.C.A.,
Auditor.

3 GEORGE V., A. 1913

CANADIAN PERCHERON HORSE BREEDERS' ASSOCIATION.

Organized August 1st, 1907. Incorporated December 3rd, 1907. Head Office, Calgary, Alta.

OFFICERS FOR 1911.

President.....W. B. Thorne, Aldersyde, Alta.
 Vice-President.....R. C. Upper, North Portal, Sask.
 Secretary-Treasurer.....F. R. Pike, High River, Alta.

DIRECTORS.

J. C. Drewry, Cowley, Alta. A. Colquhoun, Brandon, Man.
 George Lane, Calgary, Alta. R. P. Stanley, Moosomin, Sask.
 E. J. Wigle, Kingsville, Ont.
 Membership 1911, 175.

REGISTRATIONS, TRANSFERS, ETC., 1911.

Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
*1393	229	18	\$248 00

DISTRIBUTION BY PROVINCES.

	Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
Ontario.....	223	19	2	\$72 00
Manitoba.....	305	47	2	32 00
Saskatchewan.....	457	85	2	42 00
Alberta.....	249	69	9	80 00
British Columbia.....	2	4	.....	2 00
Quebec.....	26	4	3	10 00
New Brunswick.....	8	.....	.....	.....
Nova Scotia.....	4	1	.....	.....
United States.....	119	.....	.....	10 00

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Canadian Percheron Horse Breeders' Association.

January 1st to December 31st, 1911.

For registrations and memberships.....	\$ 2,919 50
Interest.....	125 65
Credits outstandings, \$74.75	\$ 3,045 15

RECEIPTS AND EXPENDITURES.

FOR CONDUCTING CANADIAN PERCHERON RECORD.

Receipts.

From Record Committee Funds.....	\$ 475 66
Balance owing to Record Committee by Association.....	513 23
	\$ 988 94

Expenditures.

Salaries to December 31st, 1911.....	\$ 863 63
Refunds to December 31st, 1921.....	124 47
Audit to December 31st, 1911.....	5 84
	\$ 993 34

*645 Registrations were Ancestors.

(Sgd.) JNO. W. BRANT,
 Accountant.

(Sgd.) GEO. L. BLATCH, F.C.A.
 Auditor.

SESSIONAL PAPER No. 15b

CANADIAN BELGIAN DRAFT HORSE BREEDERS' ASSOCIATION.

Organized 1907. Incorporated October 3rd, 1907. Head Office, Quebec, Que.

OFFICERS FOR 1911.

President.....Paul Tourigny, M.P.P., Victoriaville, Que.
 Vice-President.....Charles Eugene Dubord, Mastai, Que.
 Secretary-Treasurer.....J. A. Paquette, Dept. Agriculture, Quebec, Que.

DIRECTORS.

Dr. Wilfrid Grignon, Ste. Adèle, Terrebonne, Que.
 Joseph Girard, M.P., St. Gédéon, Lac St. Jean, Que.
 Georges Tanguay, M.P.E., Quebec, Que.
 Victor Chateauvert, Quebec, Que.
 Henri Gauvin, Quebec, Que.
 Membership 1911, 37.

REGISTRATIONS, TRANSFERS, ETC., 1911.

Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
*132	49	5	\$26 00

DISTRIBUTION BY PROVINCES.

	Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
Ontario	5	2	.....
Manitoba.....	15	1	2	\$ 2 00
Saskatchewan.....	67	33	3	12 00
Alberta.....	26	8	.....	8 00
Quebec.....	19	5	.....	2 00
United States.....	.....	.....	.....	2 00

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Canadian Belgian Draft Horse Breeders' Association.

January 1st to December 31st, 1911.

For registrations and memberships.....	\$ 367 60
Interest.....	2 90
Credits outstanding, 50c.	\$ 370 50

RECEIPTS AND EXPENDITURES.

FOR CONDUCTING BELGIAN DRAFT RECORD.

Receipts.

From Record Committee Funds.....	\$ 5 49
Balance owing to Record Committee by Association	56 55
	\$ 62 04

Expenditures.

Salaries to December 31, 1911.....	\$ 45 29
Refunds to December 31, 1911.....	16 01
Audit to December 31, 1911	0 74
	\$ 62 04

*9 Registrations were Ancestors.

(Sgd.) JNO. W. BRANT,
 Accountant.

(Sgd.) GEO. L. BLATCH, F.C.A.,
 Auditor.

3 GEORGE V., A. 1913

CANADIAN STANDARD BRED HORSE SOCIETY.

Organized February, 1909. Incorporated 1910. Head Office, Ottawa, Ont.

OFFICERS AND DIRECTORS, 1911.

Hon. President.....	Robert Davies, Toronto, Ont.
President.....	O. B. Sheppard, Toronto, Ont.
Vice-President.....	J. Wesley Allison, Morrisburg, Ont.
Secretary-Treasurer.....	John W. Brant, Ottawa, Ont.

DIRECTORS.

W. J. Cowan, Cannington, Ont.	J. M. Gardhouse, Weston, Ont.
Duncan Brown, Iona, Ont.	W. P. Kearney, Montreal, Que.
Howard Ashley, Foxboro, Ont.	W. R. Crossen, Cobourg, Ont.
J. M. Baldwin, Killarney, Man.	W. E. Baker, V.S., Hamilton, Ont.
E. J. Rochon, Winnipeg, Man.	George Peper, Toronto, Ont.
J. A. Childs, Eglinton, Ont.	

REGISTRATIONS, TRANSFERS, ETC., 1911.

Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
302	4	2	\$162.00

DISTRIBUTION BY PROVINCES.

—	Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
Ontario.....	107	3	2	\$64 00
Manitoba.....	22	1		16 00
Alberta.....	33			8 00
Saskatchewan.....	51			10 00
British Columbia.....	39			50 00
Quebec.....	28			10 00
New Brunswick.....	4			
Nova Scotia.....	14			
United States.....	4			4 00

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Canadian Standard Bred Horse Society.

January 1st to December 31st, 1911.

For registrations and memberships.....	\$1,028 25
Interest.....	15 35
	<u>\$1,045 60</u>

RECEIPTS AND EXPENDITURES.

FOR CONDUCTING STANDARD BRED RECORD.

Receipts.

From Record Committee Funds.....	\$181 08
Balance owing to Record Committee by Society.....	59 25

\$240 33

Expenditures.

Salaries to December 31st, 1911.....	\$179 02
Audit to December 31st, 1911.....	2 06
Refunds to December 31st, 1911.....	59 25

\$240 33

(Sgd.) JNO. W. BRANT,
Accountant.

(Sgd.) GEO. L. BLATCH, F.C.A.,
Auditor.

SESSIONAL PAPER No. 15b

CANADIAN THOROUGHBRED HORSE SOCIETY.

Organized 1906. Incorporated May 30th, 1906. Head Office, Toronto, Ont.

OFFICERS FOR 1911.

President..... William Hendrie, Hamilton, Ont.
 Vice-President..... Robert Davies, Todmorden, Ont.
 Second Vice-President and Secretary.....
 Treasurer..... J. J. Dixon, Toronto, Ont.

DIRECTORS.

A. E. Dymont, Toronto, Ont. Raymond F. Dale, Qu'Appelle, Sask.
 R. W. Davies, Toronto, Ont. W. J. Taylor, Victoria, B.C.
 A. E. Ogilvie, Montreal, Que.
 Membership 1911, 63.

REGISTRATIONS, TRANSFERS, ETC., 1911.

Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
276	22	6	\$34.00

DISTRIBUTION BY PROVINCES.

	Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
Ontario.....	114	12	.....	\$56 00
Manitoba.....	3	2	.....	4 00
Saskatchewan.....	11	.....	.....	2 00
Alberta.....	64	3	5	10 00
British Columbia.....	45	2	.....	2 00
Quebec.....	36	1	1	10 00
New Brunswick.....	3	.....	.....	.....

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Canadian Thoroughbred Horse Society.

January 1st to December 31st, 1911

For registrations and memberships..... \$490 25
 Interest..... 30 35

\$520 60

Credits outstanding, \$1.00.

RECEIPTS AND EXPENDITURES.

FOR CONDUCTING THOROUGHBRED RECORD.

Receipts.

From Record Committee Funds..... \$ 93 27
 Balance owing to Record Committee by Society..... 120 91

\$214 18

Expenditures.

Salaries to December 31st, 1911..... \$169 32
 Refunds to December 31st, 1911..... 43 88
 Audit to December 31st, 1911..... 0 98

\$214 18

(Sgd.) JNO. W. BRANT,
 Accountant.

(Sgd.) GEO. L. BLATCH, F.C.A.,
 Auditor.

3 GEORGE V., A. 1913

CANADIAN PONY SOCIETY.

Organized 1901. Incorporated March 25th, 1903. Head Office, Toronto, Ont.

OFFICERS FOR 1911.

Hon. President.....Charles E. Stone, Toronto, Ont.
 President.....A. E. Major, Whitevale, Ont.
 1st Vice-President.....T. A. Cox, Brantford, Ont.
 2nd Vice-President.....C. J. Lovejoy, Mimico, Ont.
 Secretary-Treasurer.....W. J. Stark, 12 Wellington St. E., Toronto, Ont.

Directors.

Robert Graham, Bedford Park, Ont. E. C. H. Tisdale, Beaverton, Ont.
 W. J. Langton, Toronto, Ont. Theo. A. McGillivray, Whitby, Ont.
 W. I. Elder, Brandon, Man. Arthur Milne, Green River, Ont.
 H. M. Robinson, Toronto, Ont. W. H. Knowlton, Toronto, Ont.
 W. J. Stark, Toronto, Ont. J. M. Gardhouse, Weston, Ont.

Membership 1911, 108.

REGISTRATIONS, TRANSFERS, ETC., 1911.

Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
88	8	.....	\$56 00

DISTRIBUTION BY PROVINCES.

	Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
Ontario.....	37	4	.....	\$44 00
Manitoba.....	17	.....	.....	6 00
Saskatchewan.....	6	1	.....	4 00
Alberta.....	22	.....	.....	2 00
British Columbia.....	5	.....	.....	.....
Quebec.....	1	3	.....	.....

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Canadian Pony Society.

January 1st to December 31st, 1911.

For registrations and memberships.....	\$ 194 70
Interest.....	2 65
	<hr/> \$197 35

RECEIPTS AND EXPENDITURES.

FOR CONDUCTING PONY RECORD.

Receipts.

From Record Committee Funds.....	\$ 30 73
Balance owing to Record Committee by Society.....	34 05
	<hr/> \$64 78

Expenditures.

Salaries to December 31st, 1911.....	\$ 55 79
Refunds to December 31st, 1911.....	8 60
Audit to December 31st, 1911.....	39
	<hr/> \$64 78

(Sgd.) JNO. W. BRANT,
 Accountant.

(Sgd.) GEO. L. BLATCH, F.C.A.
 Auditor.

SESSIONAL PAPER No. 15b

CANADIAN SUFFOLK HORSE SOCIETY.

Organized 1910. Incorporated April 27th, 1910. Head Office, Lamerton, Alta.

OFFICERS FOR 1911.

President.....Raymond Knight, Raymond, Alta.
 Vice-President.....Patrick Burns, Calgary, Alta.
 Secretary-Treasurer.....Archie Jaques, Lamerton, Alta.

Directors.

Mossom Boyd, Bobcaygeon, Ont. F. J. Hartell, Cheadle, Alta.
 M. Loggan, Calgary, Alta. John Lyons, Cheadle, Alta.
 J. Barker, Calgary, Alta. Norman Jaques, Lamerton, Alta.
 J. A. W. Fraser, Jumping Pond, Alta.
 Membership 1911, 17.

REGISTRATIONS, TRANSFERS, ETC., 1911.

Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
100	5	.....	\$13 00

DISTRIBUTION BY PROVINCES.

	Registrations.	Transfers.	Dup. and New Certificates.	Membership Rec.
Ontario.....	36	1	.....	\$ 2 00
Manitoba.....	1	.....	.....	.....
Saskatchewan.....	21	.....	.....	6 00
Alberta.....	42	4	.....	10 00

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Canadian Suffolk Horse Society.

January 1st to December 31st, 1911.

For registrations and memberships.....	\$ 232 35
Interest.....	5 00
Credits outstanding, \$3.00.	\$237 35

RECEIPTS AND EXPENDITURES.

FOR CONDUCTING SUFFOLK RECORD.

Receipts.

From Record Committee Funds.....	\$ 56 26
Balance owing to Record Committee by Society.....	2 39
	\$58 65

Expenditures.

Salaries to December 31st, 1911.....	\$ 55 79
Audit to December 31st, 1911.....	47
Refunds to December 31st, 1911.....	2 39
	\$58 65

(Sgd.) JNO W. BRANT,
 Accountant.

(Sgd.) GEO. L. BLATCH F.C.A.
 Auditor.

SESSIONAL PAPER No. 15b

DISTRIBUTION OF SALARIES 1911.

Association.	Cost of Accountants' Department.	Cost of Registrars' Department.	Charged to each Association.	Charged to Government Grant.	Paid out of Record Com. Account.	Total paid on Acct. of each Association.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Swine.....	655 50	996 35	1,228 04	423 81	.....	1,651 85
Sheep.....	248 29	481 15	586 71	192 73	.....	779 44
Shorthorn.....	918 24	2,653 50	2,925 10	651 61	.....	3,576 74
Ayrshire.....	267 15	629 77	728 87	368 03	.....	1,096 92
Hereford.....	188 41	254 40	294 27	148 54	.....	442 81
Jersey.....	123 22	166 15	192 05	97 32	.....	289 37
Galloway.....	5 56	7 20	8 33	4 43	.....	12 76
Aberdeen Angus.....	115 56	156 27	180 74	91 09	.....	271 83
Guernsey.....	3 30	5 22	6 01	2 51	.....	8 52
Canadian Cattle.....	42 04	81 30	108 38	14 96	.....	123 34
Red Polled.....	18 86	23 49	27 41	14 94	.....	42 35
Clydesdale.....	619 06	1,950 00	2,348 80	220 26	.....	2,569 06
Shire.....	25 82	137 57	73 86	89 53	.....	163 39
Hackney.....	20 32	107 91	57 42	70 81	.....	128 23
Canadian Horse.....	11 48	22 20	29 59	4 09	.....	33 68
Percheron.....	136 90	726 73	387 97	475 66	.....	863 63
Belgian Draft.....	15 44	29 85	39 80	5 49	.....	45 29
Standard Bred.....	28 38	150 64	.....	179 02	.....	179 02
Thoroughbred.....	26 84	142 48	76 05	93 27	.....	169 32
Pony.....	8 84	46 95	25 06	30 73	.....	55 79
Suffolk.....	8 84	46 95	.....	55 79	.....	55 79
French Coach.....	95	5 77	.....	6 72	.....	6 72
Translator.....	1,491 65	.....	.....	1,491 65	.....	1,491 65
Temporary assistance.....	119 05	.....	.....	.....	119 05	119 05
Proof Reader and other assistance...	1,088 33	.....	.....	.....	1,088 33	1,088 33
	6,438 03	8,826 85	9,324 46	4,733 04	1,207 38	15,264 88

COMPARATIVE STATEMENT for the years 1907, 1908, 1909, 1910, 1911, showing Pedigrees and Transfers recorded and amount of fees received.

Association.	Pedigrees Recorded.					Transfers Recorded.					Money Received.									
	1907.	1908.	1909.	1910.	1911.	1907.	1908.	1909.	1910.	1911.	1907.	1908.	1909.	1910.	1911.					
											\$	cts.	\$	cts.	\$	cts.				
Shorthorn.....	10,253	7,038	7,487	7,544	7,430	2,804	2,272	2,827	3,044	2,639	14,508	10,832	12,214	11,974	11,731	73				
Ayrshire.....	2,144	1,633	2,373	2,385	2,833	914	634	985	1,079	1,254	2,707	2,635	3,496	4,126	4,770	30				
Hereford.....	683	951	1,214	819	1,295	141	277	265	345	340	828	933	1,300	1,089	1,672	52				
Swine.....	4,335	3,735	5,702	8,205	7,136	594	459	407	537	732	4,962	3,422	3,121	3,716	5,390	45				
Clydesdale.....	6,117	2,665	5,169	5,702	3,864	511	560	1,812	2,078	2,400	7,296	4,575	11,253	13,128	13,311	35				
Hackney.....	132	112	182	167	138	55	15	71	67	67	395	342	686	644	675	70				
Shire.....	100	124	284	126	190	8	9	40	50	71	165	194	573	386	488	25				
Thoroughbred.....	6	139	273	243	276	.....	.....	.....	22	22	24	262	583	503	490	25	
Sheep.....	3,628	2,060	2,572	2,105	2,836	240	190	570	309	664	1,234	1,314	1,682	1,616	2,161	65				
Aberdeen Angus.....	1,106	820	670	917	772	84	94	132	222	236	341	563	625	1,561	901	33				
Galloway.....	103	96	41	71	38	4	15	11	40	6	56	119	51	79	10	39				
Jersey.....	326	223	340	543	715	27	92	107	141	336	334	304	505	900	755	60				
Red Poll.....	36	172	320	196	145	2	5	4	20	22	28	40	56	107	123	50				
Guernsey.....	38	73	76	87	99	4	5	19	30	17	47	68	25	106	90	132	75			
Canadian Cattle.....	576	324	254	257	325	42	51	72	86	115	135	174	275	312	440	70				
Canadian Horses.....	474	246	85	118	61	3	8	23	16	16	228	237	530	318	80	157	65			
Pony.....	49	37	102	88	88	2	8	64	20	73	185	83	194	70		
Belgian.....	16	58	132	163	132	49	22	80	210	492	387	60		
Percheron.....	969	1,383	6	9	87	229	1,176	1,529	2,082	2,919	50		
Suffolk.....	22	100	5	96	85	232	35	
French Coach.....	12	13	32	40	45	00	
Standard Bred.....	42	302	4	196	50	1,028	25	
Total.....	31,999	22,390	26,163	30,805	30,201	5,433	4,752	7,387	8,202	9,232	32,985	27,439	40,078	47,277	48,756	15

* All Scottish ancestry recorded in former years, discontinued commencing with 1911.

IMPORTATIONS, 1911.

Animals for the improvement of stock were imported as follows during 1911:—

Clydesdale Horses.. . . .	1,367	Suffolk Horses.. . . .	54
Percheron Horses.. . . .	540	Swine.. . . .	52
Standard Bred Horses.. . . .	234	Hereford Cattle.. . . .	51
Ayrshire.. . . .	160	Red Polled Cattle.. . . .	47
Belgian Horses.. . . .	114	Hackney Horses.. . . .	33
Thoroughbred Horses.. . . .	113	Shorthorn Cattle.. . . .	25
Sheep.. . . .	86	American Saddle Horses.. . . .	9
Shire Horses.. . . .	85	Guernsey Cattle.. . . .	6
Ponies.. . . .	80	French Coach Horses.. . . .	5
Aberdeen Angus Cattle.. . . .	79	Morgan Horses.. . . .	5
Jersey Cattle.. . . .	71	German Coach Horses.. . . .	4
		Hunter Horses.. . . .	4
		Total.. . . .	3,219

EXPORTATIONS TO THE UNITED STATES.

From January 1st to December 31st, 1911.

The Bureau of Animal Industry at Washington issued certificates of pure breeding for animals exported from Canada as follows:—

For Horses—Shire, 1; Standard Bred, 1; Belgian, 2; Hackney, 4; Clydesdale, 29; For Cattle—Shorthorn, 47; Ayrshire(186; For Sheep—Oxford Down, 90. For Swine—Hampshire, 1; Poland China, 1; Yorkshire, 2; Tamworth, 32.

HERD, STUD AND FLOCK BOOKS ISSUED IN 1911, OR NOW IN THE PRESS.

	Volume.
Dominion Shorthorn Herd Book.. . . .	28
Canadian Ayrshire Herd Book.. . . .	20 & 21
Dominion Swine Breeders' Record.. . . .	22
Clydesdale Stud Book of Canada.. . . .	19 & 20
Clydesdale Index.. . . .	1 to 18 inc.
Canadian National Record for Sheep.. . . .	2
Canadian Hereford Herd Book.. . . .	6
Canadian Aberdeen Angus Herd Book.. . . .	2
Canadian Percheron Stud Book.. . . .	1

TRANSPORTATION OF PURE BRED ANIMALS.

All animals recorded in the Canadian National Records are entitled to reduced freight rates over the Grand Trunk, Grand Trunk Pacific, Canadian Pacific, Intercolonial and Canadian Northern railways when shipped for breeding purposes. These rates do not apply when animals are shipped to exhibitions or for the purpose of contesting in races. Canadian freight classification as to weights govern.

There is no reduction when animals are shipped by express.

In the case of imported animals of a breed for which there is no Canadian record, but which are recorded in a recognized foreign record, (see page 39), an arrangement has been made for transportation at reduced rates from the point of entry into Canada to destination on presentation of a transportation certificate to the railway agent. This certificate is issued by the National Record Office in connection with import certificate, and is taken up by the railway agent.

MEMBERS, 1911.

Dominion Shorthorn Breeders' Association.. . . .	2,056
Clydesdale Horse Association of Canada.. . . .	1,750
Canadian Ayrshire Breeders' Association.. . . .	781
Dominion Swine Breeders' Association.. . . .	573
Dominion Sheep Breeders' Association.. . . .	315
Canadian Hereford Breeders' Association.. . . .	237
Canadian Percheron Horse Breeders' Association.. . . .	175
Canadian Jersey Cattle Club.. . . .	174
Canadian Aberdeen-Angus Association.. . . .	152
Canadian Hackney Horse Society.. . . .	146
French Canadian Cattle Breeders' Association.. . . .	139
French Canadian Horse Breeders' Association.. . . .	127
Canadian Pony Society.. . . .	108
Canadian Shire Horse Association.. . . .	105
Canadian Standard Bred Horse Society.. . . .	66
Canadian Thoroughbred Horse Society.. . . .	63
Canadian Guernsey Breeders' Association.. . . .	38
Canadian Belgian Draft Horse Breeders' Association.. . . .	37
Canadian Red Polled Association.. . . .	18
Canadian Suffolk Horse Society.. . . .	17
North American Galloway Association.. . . .	16
Canadian French Coach Horse Breeders' Association.. . . .	4

The annual membership fee to each association is \$2 with the following exceptions: Canadian Hackney Horse Society, \$3; Dominion Sheep Breeders' Association, Canadian Jersey Cattle Club, North American Galloway Association, Canadian Guernsey Breeders' Association, French Canadian Cattle Breeders' Association and the French Canadian Horse Breeders' Association, \$1.

CANADIAN CUSTOMS REGULATIONS BY WHICH ANIMALS FOR THE IMPROVEMENT OF STOCK ARE ADMITTED FREE OF DUTY.

CUSTOMS MEMO. 1522-B.

CONSOLIDATED AND AMENDED REGULATIONS RESPECTING FREE ENTRY OF ANIMALS FOR THE IMPROVEMENT OF STOCK, IN EFFECT MARCH 1, 1909.

Memo. No. 1480-B and Memo. No. 1482-B are hereby cancelled and the following regulations are submitted therefor, in effect March 1, 1909:--

Under Order in Council of May 21, 1908, His Excellency the Governor in Council is pleased to order that on and after the 1st day of July, 1908, the regulations established by Order in Council of November 8, 1887, respecting 'animals for the improvement of stock,' shall be and the same are hereby revoked, and the following regulations prescribed in respect of the free entry under the Customs Tariff of horses, cattle, sheep, goats, asses and swine, for the improvement of stock:--

Regulations.

1. No animal imported for the improvement of stock shall be admitted free of duty unless the importer is domiciled in Canada or is a British subject, and furnishes a certificate of the record and pedigree in a list of registers designated from time to time by the Minister of Customs, showing that the animal is pure bred and has been admitted to full registry in a book of record established for that breed.

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An affidavit by the owner, agent or importer that such animal is the identical animal described in said certificate of record and pedigree must be presented.

2. In case such certificate is not at hand at the time of the arrival of the animals, the entry for duty may be accepted subject to the refund of the duty upon production of the requisite certificates and proofs in due form satisfactory to the collector, within one year from the time of entry.

3. The form of certificate of record and pedigree to be accepted for the free importation of animals for the improvement of stock, and the Customs procedure in connection therewith shall be subject to the directions of the Minister of Customs.

Instructions.

(a) The following is a list of registers designated by the Minister of Customs, in one of which animals must be registered as pure bred, prior to admission free of duty for the improvement of stock, viz.:—

For Holstein-Friesian Cattle.

THE HOLSTEIN-FRIESIAN ASSOCIATION OF CANADA, ST. GEORGE, ONT

For Horses, Cattle, Sheep, Goats, Asses and Swine (but not including Holstein-Friesian Cattle.)

CANADIAN NATIONAL RECORDS, OTTAWA, CANADA.

Also any register certified by the accountant of the Canadian National Records as a recognized book of record in the country of the origin of the breed.

(b) An import form of certificate, to be delivered to the Collector of Customs before free entry of animals for improvement of stock is allowed, shall be in one of the forms following, viz.:—

For Live Stock other than Holstein-Friesian cattle.

IMPORT CERTIFICATE.

CANADIAN NATIONAL RECORDS.

FORM 2.

I hereby certify that the animal (name).....
(number).....is pure bred and is registered in the (state
book of record).....the Canadian book of
Record for (state breed).....
(Signature).....

Accountant, Canadian National Records.

OTTAWA, CANADA,.....19....

IMPORT CERTIFICATE.

CANADIAN NATIONAL RECORDS.

FORM 2-A.

I hereby certify that the animal (name).....
(number).....is registered in the (state book of record)
.....the recognized book of record in the
country of the origin of the breed of (state breed).....
(Signature).....

Accountant, Canadian National Records.

OTTAWA, CANADA,.....19....

3 GEORGE V., A. 1913

For Holstein-Friesian Cattle:—

IMPORT CERTIFICATE.

HOLSTEIN-FRIESIAN ASSOCIATION OF CANADA.

FORM 1.

I hereby certify that the animal (name).....
 (number).....is pure bred and is registered in the
 Holstein-Friesian Herd Book of Canada, the Canadian Book of Record for Holstein-
 Friesian Cattle.

(Signature).....

Secretary.
Holstein-Friesian Breeders' Association
of Canada.

ST. GEORGE, ONTARIO,..... 19....

(c) The Import Certificate shall be attached to the free Customs entry for trans-
 mission by the collector to the Department of Customs, Ottawa.

The said certificate shall be marked in each case with the Customs entry number
 and the office dating stamp.

**The Collector of Customs shall not demand or accept any certificate as to
 pedigree, other than in one of the 'Import Certificate' forms herein prescribed.**

(d) Animals may be shipped in bond from the Canadian frontier port to the
 Customs port of destination, subject to quarantine requirements.

(e) Import certificates for Holstein-Friesian cattle are issued by the secretary
 of the Holstein-Friesian Association of Canada, St. George, Ontario.

(f) Import certificates for live stock other than Holstein-Friesian cattle, may
 be procured on application to 'Accountant,' Canadian National Records, Ottawa,
 from whom there may also be obtained a list of Canadian Records, lists of recognized
 foreign records, and other information concerning the importation of pure bred
 animals for the improvement of stock.

(Sgd.) JOHN McDOUGALD,
Commissioner of Customs.

NOTE.—Importers should see that Canadian Certificates of Registration or
 Foreign Certificates are not handed to the Customs. Read section 3, paragraph 3,
 above.

Accountant, C.N.L.S.R.

THE REGULATIONS EXPLAINED.

To obtain free Customs entry of an animal of a breed for which there is a Cana-
 dian Record (other than Holstein-Friesian Cattle), the importer must forward to the
 Accountant, Canadian National Records, Ottawa, an application made out on a form
 supplied by the National Record Office, accompanied by the Foreign Certificates of
 Registration, and the necessary fees for registration as specified elsewhere in this
 report, and in addition for Import Certificate, a fee of 50 cents for Horses and Cattle
 and 10 cents for Swine and Sheep. The Foreign Certificate of Registration must in
 all cases show the Canadian importers' ownership.

The Import Certificate will be forwarded to pass Customs at the point of entry
 into Canada or elsewhere as the importer may direct. In no case should the importer
 present any certificate of registration to the Custom authorities other than the Import
 Certificate.

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Importers should be careful to observe the veterinary requirements in connection with the importation of animals. (See page 50). Further information may be procured from the Veterinary Director General, Ottawa, Canada.

CANADIAN BOOKS OF RECORD.

HORSES.

Name of Breed.	Book of Record	Name of Association.
Clydesdale.....	Clydesdale Stud Book of Canada.....	Clydesdale Horse Association of Canada.
Hackney.....	Canadian Hackney Stud Book.....	Canadian Hackney Horse Society.
Shire.....	Canadian Shire Horse Stud Book.....	Canadian Shire Horse Association.
Percheron.....	Canadian Percheron Stud Book.....	Canadian Percheron Horse Breeders' Association.
Thoroughbred.....	Canadian Thoroughbred Stud Book.....	Canadian Thoroughbred Horse Society.
Belgian Draft.....	Canadian Belgian Draft Stud Book.....	Canadian Belgian Draft Horse Breeders' Association.
French Canadian.....	French Canadian Horse Breeders' Stud Book.....	French Canadian Horse Breeders' Association of Canada.
Shetland, Welsh, New Forest, Polo and Riding, Exmoor and Hackney Ponies.....	Canadian Pony Stud Book.....	Canadian Pony Society.
French Coach.....	Canadian French Coach Stud Book.....	Canadian French Coach Horse Breeders' Association.
Suffolk Horse.....	Canadian Suffolk Horse Stud Book.....	Canadian Suffolk Horse Society.
Standard Bred.....	Canadian Standard Bred Stud Book.....	Canadian Standard Bred Horse Society.

CATTLE.

Shorthorn.....	Dominion Shorthorn Herd Book.....	Dominion Shorthorn Breeders' Association.
Ayrshire.....	Canadian Ayrshire Herd Book.....	Canadian Ayrshire Breeders' Association.
Hereford.....	Canadian Hereford Herd Book.....	Canadian Hereford Breeders' Association.
Jersey.....	Canadian Jersey Cattle Club Record.	Canadian Jersey Cattle Club.
Galloway.....	North American Galloway Herd Book.	North American Galloway Association.
Aberdeen Angus.....	Canadian Aberdeen Angus Association's Record.	Canadian Aberdeen Angus Association.
Guernsey.....	Canadian Guernsey Herd Book.....	Canadian Guernsey Breeders' Association.
French Canadian.....	French Canadian Cattle Breeders' Herd Book.....	French Canadian Cattle Breeders' Association of Canada.
Red Polled.....	Canadian Red Polled Herd Book.....	Canadian Red Polled Association.
Holstein-Friesian.....	Holstein-Friesian Herd Book of Canada.....	Holstein-Friesian Association of Canada.

SWINE.

Name of Breed.	Book of Record.	Name of Association.
Yorkshire, Berkshire, Tamworth, Chester White, Poland China, Duroc Jersey, Hampshire, Essex.....	Dominion Swine Breeders' Record...	Dominion Swine Breeders' Association...

SHEEP.

Shropshire, Leicester, Oxford Down, Cotswold, Lincoln, Dorset, Hampshire, Southdown, Suffolk, Cheviot, Blackface.....	Canadian National Records.....	Dominion Sheep Breeders' Association...
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FOREIGN BOOKS OF RECORD.

IMPORT CERTIFICATES FOR ANIMALS OF A BREED FOR WHICH THERE IS NO CANADIAN RECORD.

In order to secure free Customs entry for an animal of a breed for which there is no Canadian Record, but which is recorded in a foreign record recognized as reliable, the importer must forward to the Accountant, Canadian National Records, the foreign certificate of registration accompanied by fees as follows:—For horsers, cattle or asses, \$2.00 each, for sheep, swine or goats, 50 cents each. The Import Certificate will be forwarded to pass the Customs at the point of entry into Canada or elsewhere as the importer may direct.

In no case should the importer present any certificate of registration to the Customs authorities other than the Import Certificate.

Importers should be careful to observe the veterinary requirements in connection with the importation of animals. (See page 50). Further information may be procured from the Veterinary Director General, Ottawa, Canada.

RECOGNIZED FOREIGN RECORDS.

HORSES.

Name of Breed.	Book of Record.	Name of Association.
Cleveland Bay.....	Cleveland Bay Stud Book.	Cleveland Bay Horse Society of Great Britain and Ireland, Nunthorpe, R. S. O., England.
Yorkshire Coach.....	Yorkshire Coach Horse Stud Book....	Yorkshire Coach Horse Society of Great Britain and Ireland, Bolton Perdy, R. S. O., England.
Morgan.....	American Morgan Register.....	American Morgan Register Association, Middlebury, Vt., U.S.A.
Saddle Horse.....	American Saddle Horse Register.....	American Saddle Horse Breeders' Association, Louisville, Ky.
German Coach.....	Ostfriesisches Stutbuch.....	Landwirtschaftlichen, Hauptverein für Ostfriesland, Norden, Germany.
Oldenburg	Stutbuch der Munsterlandisch-Oldenburgischen Geest.....	Zuchtverband des Südlischen Zuchtgebietes, Oldenburg, Germany.
	Oldenburger Stutbuch.....	Verband der Züchter des Oldenburger eleganten schweren Kutschpferdes, Oldenburg, Germany.
Holstein Coach.....	Gestutbuch der Holsteinischen Marschen.....	Verband der Pferdezüchter in den Holsteinischen Marschen, Holstein, Germany.
Hunter.....	Hunter Stud Book.....	Hunters' Improvement Society, 12 Hanover Square, London, England.

CATTLE.

Highland.	Highland Herd book.....	Highland Cattle Society of Scotland, Inverness, Scotland.
Kerry & Dexter.....	Kerry & Dexter Herd Book.....	Kerry & Dexter Herd Book, Dublin, Ireland.
Sussex.....	Sussex Herd book.....	Sussex Herdbook Society, London, England.
Devon... ..	Davies Devon Herd Book.....	Devon Cattle Breeders' Society, Wiveliscombe, England.
Longhorned Cattle	Longhorned Herd Book.	Longhorned Cattle Society, Atherstone, England.
Welsh Black Cattle.....	Welsh Black Cattle Herd Book.....	Welsh Black Cattle Society, Haverfordwest, Wales.
Polled Durham.....	American Polled Durham Herd Book.	Polled Durham Breeders' Association, Indianapolis, Ind., U.S.
Polled Hereford.....	National Polled Hereford Herd Book.	National Polled Hereford Breeders' Association, Chicago, Ill., U.S.A.
Lincolnshire Red Short-horn.....	Lincolnshire Red Shorthorn Association Herd Register.....	Lincolnshire Red Shorthorn Association.

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SWINE.

Name of Breed.	Book of Record.	Name of Association.
Large Black Pig.....	Large Black Pig Society Herd Book.	Large Black Pig Society, Ipswich, England.
Lincolnshire Curly Coated Pig.....	Curly Coated Pig Breeder's Herd Book	Lincolnshire Curly Coated Pig Breeders' Association, Thornhayes, England.

SHEEP.

Kent or Romney Marsh	Kent or Romney Marsh Flock Book..	Kent or Romney Marsh Sheep Breeders' Association, London, W.C., England.
Wensleydale Longwool..	Wensleydale Flock Book	Wensleydale Longwool Sheep Breeders' Association, Yorkshire, England.
Wensleydale Bluefaced..	Wensleydale Bluefaced Flock Book ..	Incorporated Wensleydale Bluefaced Sheep Breeders' Association and Flock Book Society, Carperby, England.
Dartmoor....	Dartmoor Sheep Breeders' Association Flock Book.....	Dartmoor Sheep Breeders' Association.

GOATS.

Goats.....	British Goat Society Herd Book....	British Goat Society, Kingsten on Thames, England.
Toggenburg.....	Toggenburg Herd Book... ..	Toggenburg Club, Beefolds, Farnham, England.

ASSES.

Jacks and Jennets....	Studbook Mulassier.....	Société Centrale d'Agriculture des deux Sevrès.
Jacks and Jennets.....	Studbook of Jack & Jennets of Spain.	

APPLICATIONS FOR CANADIAN REGISTRATION AND IMPORT CERTIFICATE.

In the case of cattle, sheep and swine from European countries the importer need not make application for registration and import certificate until the animals arrive at quarantine, as the quarantine period allows ample time to secure certificates before having to pass the Customs.

In the case of horses from European countries the importer should, if possible, forward his foreign certificates, along with application and fees, on a mail boat sailing before the stock is shipped. Import certificates and Canadian certificates of registration can then be sent to meet the horses on landing. The Canadian certificate is necessary in order to get the reduced freight rates. In the case of late purchasers, importers landing horses at Montreal or at St. John, or other Atlantic ports, may mail their applications, foreign certificates and fees on landing and then ship in bond subject to quarantine requirements, to the nearest Custom House to destination. It must in all cases be definitely stated where import certificates are to be forwarded.

In addition to the foreign certificate of registration, an application made out on the regular form, supplied by the National Record Office, is required. The foreign certificate of registration must show the ownership of the Canadian importer. Fees for registration are indicated elsewhere in this report.

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For animals imported in dam, certificates of service must be procured from the breeder, signed by the owner of the sire at the time of service.

The National Record Office gives special service in issuing import certificates. Certificates will be mailed to the importer in care of the Customs officer at the port of entry, or to any other address desired.

Canadians wishing to import pure bred animals from the United States, in order to avoid delay and trouble at the port of entry, should secure registration of the animals in the Canadian Record and Import Certificates before the animals are shipped.

In the case of swine from the United States, which the present health regulations require to be quarantined, the registration of animals may, if desired, be deferred until after the animals have arrived at quarantine.

It will be observed from paragraph 1 of the regulations that only British subjects or persons domiciled in Canada are entitled to the privilege of free entry of animals for the improvement of stock. This does not apply to settlers who are accorded certain privileges in regard to the bringing in of settlers' effects.

Blank application forms and other information, if desired, will be furnished on application to the accountant, National Live Stock Records, Ottawa, Canada.

ELIGIBILITY OF ANIMALS FOR CANADIAN RECORDS.

It is important that Canadian importers, before purchasing animals of a breed for which there is a Canadian record, ascertain if they are recorded in the proper foreign record, and if so, if they are eligible for record in Canada. Canadian registration of imported animals will not be made unless proper foreign certificate is presented, and ownership of animals properly authenticated.

Canadian records, with the exception of those for French Canadian cattle and French Canadian horses, which are purely Canadian, are for the most part based on the records of the countries of the origin of the breeds, but as the Canadian standard of registration is higher in some cases than the standard in the country of origin, or that of other countries, animals may or may not be eligible for entry in the Canadian Records. The following will assist in arriving at the eligibility of an animal. The fees for recording animals in the Canadian Records, bred in other countries, are indicated in each case. (These fees do not in all cases apply to the recording of Canadian bred animals). In addition to the registration fee, 50 cents is charged for each import certificate for horses and cattle, and 10 cents for sheep and swine.

HORSES.

CLYDESDALE.

Animals recorded and numbered in the Clydesdale Stud Book of Great Britain and Ireland are eligible, provided their sires and dams and grand sires and grand dams are also recorded and numbered therein. The breeding of many horses recorded in the Scottish book does not come up to this standard.

Fees to members.—Animals imported from Great Britain, stallions, \$3; mares, \$2. To non-members, stallions, \$4; mares, \$3. Annual membership, \$2. If animals are not recorded within 30 days of importation, the fee is \$25, and \$50 to members and non-members respectively.

HACKNEY.

Stallions full registered and all mares if by full registered sires recorded in the American Hackney Stud Book, and animals bred in Great Britain or Ireland and recorded in the English Hackney Stud Book, as follows:—

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(a) Stallions with three top crosses of *full registered sires and with two registered dams.

(b) Mares with two top crosses of *full registered sires with one registered dam.

(c) Mares with one top cross of *full registered sires with a registered dam.

Fees to members, \$2; to non-members, \$4. An additional fee of \$1 is charged for each ancestor recorded to complete pedigrees of animals recorded in the American Stud Book. Annual membership, \$3.

SHIRE.

All animals recorded in the English Shire Horse Stud Book or in the American Shire Horse Stud Book, providing their breeding complies with the Canadian standard of registration. Fees to members—animals under three years of age, \$1; animals over three years of age, \$2. To non-members, animals under three years of age, \$2; animals over three years of age, \$4. An additional fee of \$1 is charged for each ancestor recorded to complete pedigrees of animals recorded in the American Stud Book.

PERCHERON.

All animals recorded in the Stud Book Percheron de France or in the American Percheron Stud Book, if, on investigation, their pedigrees are found to be correct. Fees to members—stallions, \$3; mares, \$1; to non-members—stallions, \$5; mares, \$2. An additional fee of 50 cents is charged for each ancestor recorded to complete pedigrees of animals recorded in the American Percheron Stud Book (Chicago). Annual membership, \$2.

No American bred Percheron will be accepted for registration unless certificate of registration issued by the American Percheron Society, Wayne Dinsmore, Union Stock Yards, Chicago, secretary, is presented with the application.

THOROUGH-BRED.

All animals recorded in the General Stud Book (Great Britain), American, French, Belgian, or Australian stud books. Fees to members, \$1; to non-members, \$2. Annual membership, \$2.

BELGIAN.

All animals recorded in the Stud Book des Chevaux de Traits Belges, or in the American Register of Belgian Draft Horses. Fees to members—stallions, \$3; mares, \$1; to non-members—stallions, \$4; mares, \$2. An additional fee of 50 cents is charged for each ancestor recorded to complete pedigrees of animals recorded in the American Stud Book. Annual membership, \$2.

SHETLAND PONIES.

All animals recorded in the Shetland Pony Stud Book, of Scotland, or the Shetland Islands Pony Stud Book, animals recorded in the American Shetland Pony Stud Book. Fees to members, \$1; to non-members, \$2. Annual membership, \$2.

WELSH PONIES.

All animals recorded in the Welsh Pony and Cob Stud Book (Great Britain), or in the American Welsh Pony and Cob Stud Book. Fees same as Shetland Ponies.

*Full registered sires are those (a) that are recorded as such in any of the first sixteen volumes of the English Hackney Stud Book, or (b) those recorded since volume 16, providing they were eligible to full registry under the rules in force for entries in volume 16 of the English Hackney Stud Book.

NEW FOREST PONIES.

Animals imported from Great Britain, recognized as pure bred. A certificate to this effect must be furnished, signed by the breeder and certified by the secretary of the association for the improvement of the breed of New Forest ponies (Great Britain). Fees same as Shetland ponies.

POLO AND RIDING PONIES.

All animals recorded in the Polo Section of the Polo and Riding Pony Stud Book (Great Britain). Fees same as Shetland ponies.

EXMOOR PONIES.

Animals imported from Great Britain, bred by reputable breeders. Certificate of breeding signed by breeder must be furnished. Fees same as Shetland ponies.

HACKNEY PONIES.

Pony stallions or mares recorded in the American Hackney Stud Book. Rules for ponies imported from Great Britain or Ireland, same as for Hackney horses (*see* page 44). Fees to members, \$1; to non-members, \$2. Annual membership, \$2.

FRENCH COACH.

All animals recorded in the Stud Book Francais Registre des Chevaux de Demi-Sang, or animals recorded in the French Coach Horse Stud Book of America, or in the American French Coach Horse Register, if upon investigation, pedigrees are found to be correct and proper. Fees to members—stallions, \$3; mares, \$1; to non-members—stallions, \$5; mares, \$2. Annual membership, \$2.

SUFFOLK.

All animals recorded in the English Suffolk Stud Book, or in the American Suffolk Horse Stud Book. Fees to members stallions, \$3; mares, \$2; to non-members, stallions, \$4; mares, \$3. Annual membership, \$2.

STANDARD BRED.

All animals recorded as Standard in the American Trotting Register (Chicago). Fees to members, \$1.50; to non-members, \$3. Annual membership, \$2.

CATTLE.

SHORTHORN.

Animals imported from Great Britain that trace in all their crosses to animals recorded or eligible for record in the Fortieth or preceding volumes of Coates English Herd Book. Animals recorded in the American Shorthorn Herd Book providing they trace in all their crosses to named ancestors imported from Great Britain. The breeding of such animals, however, must be of the standard required by the rules of entry of the Dominion Shorthorn Breeders' Association. Many animals on record in the American Shorthorn Herd Book are not eligible for entry in the Dominion Shorthorn Herd Book. Fees to members—English animals, 75 cents; American animals, 75 cents; to non-members—English animals, \$1.25; American animals, \$1.25. An additional fee of 50 cents is charged for each ancestor recorded to complete pedi-

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grees of animals recorded in the American Herd Book. All crosses back to and including those imported from Great Britain must be recorded. Annual membership, \$2.

AYRSHIRE.

All animals recorded in the Herd Book of the Ayrshire Cattle Herd Book Society of Great Britain and Ireland. All animals recorded in the American Ayrshire Herd Book. Fees to members—animals bred in Great Britain or Ireland, \$1; American bred animals, \$1; to non-members—animals bred in Great Britain or Ireland, \$2; American bred animals, \$2. Additional fees as follows are charged for ancestors recorded to complete pedigrees of animals recorded in the American Book. All animals back to and including those imported from Great Britain, must be recorded. For ancestors owned by applicant, \$1; for ancestors not owned by applicant, 25 cents. Annual membership, \$2.

HEREFORD.

All animals recorded in the English Hereford Herd Book. All animals recorded in the American Hereford Herd Book. Fees to members—animals imported from Great Britain, 75 cents; animals imported from the United States, 75 cents; to non-members—animals imported from Great Britain, \$2; animals imported from the United States, \$2. Additional fees as follows are charged for recording ancestors to complete pedigrees of animals recorded in the American Book. All ancestors back to those and including those imported from Great Britain must be recorded. To members resident in Canada, 50 cents each; to members resident in the United States, 75 cents each; to all non-members, \$2 each. Annual membership, \$2.

JERSEY.

All animals recorded in the Island of Jersey Herd Book. Animals recorded in the English Jersey Herd Book, providing they trace in all their crosses to animals recorded in the Island of Jersey Herd Book. Importers of Jerseys from Great Britain or the Island of Jersey must comply with the import regulations of the Canadian Jersey Cattle Club, which will be supplied on application. Fees to members—animals imported from Great Britain or the Island of Jersey, \$1; animals bred in the United States and recorded in the American Book, 50 cents; to non-members—animals imported from Great Britain or the Island of Jersey, \$1.50; animals bred in the United States and recorded in the American Book, \$1. Animals bred in the United States not recorded in the American Book, to members, \$1; to non-members, \$1.50; if under two years of age; if over two years of age, \$1.50 and \$2 respectively. Annual membership, \$1.

GALLOWAY.

Animals recorded in the Galloway Herd Book of Great Britain or the American Galloway Herd Book. Fees to members—animals under six months of age, 50 cents; animals over six months of age, \$1; to non-members, animals under six months of age, \$1; animals over six months of age, \$1.50. Annual membership, \$1.

ABERDEEN ANGUS.

Animals recorded in the Polled Herd Book (Scotland), or in the American Aberdeen Angus Herd Book. Fees to members, \$1, for animals under one year of age, \$3; for animals over one year of age; to non-members, \$2 for animals under one year of age, \$5 for animals over one year of age. An additional fee of 50 cents is charged for each ancestor recorded to complete pedigrees of animals recorded in the American Book.

GUERNSEY.

Animals recorded in the Herd Book of the Royal Guernsey Agricultural Society, the General Herd Book of Guernsey, in the Herd Book of the English Guernsey Cattle Club Herd Register, or in the American Guernsey Cattle Club Herd Register. Animals recorded in other than the Island of Guernsey Record, must trace in all their crosses to animals imported from the Island. Fees to members, \$1; to non-members, \$2. Annual membership, \$1.

RED POLLED.

Animals recorded in the Red Polled Herd Book of Great Britain or in the American Red Polled Herd Book. Fees to members, \$1; to non-members, \$2. Annual membership, \$2. An additional fee of 25 cents for each ancestor recorded to complete pedigrees of animals recorded in the American Red Polled Herd Book is charged.

SWINE.

YORKSHIRE.

Animals recorded in the Large White Section of the English National Pig Breeders' Association Herd Book, or in the American Yorkshire Record. Fees to members, 50 cents; to non-members, \$1. An additional fee of 50 cents to members, and \$1 to non-members, is charged for each ancestor recorded to complete pedigrees of animals recorded in the American Book. All ancestors back to and including those imported from Great Britain must be recorded. Annual membership, \$2.

BERKSHIRE.

Animals recorded in the British Berkshire Herd Book or in the American Berkshire Record. Fees same as Yorkshire, including charges for recording ancestors in American Book.

TAMWORTH.

Animals recorded in the Tamworth Section of the English National Pig Breeders' Association Herd Book, or in the American Tamworth Swine Record. Fees same as Yorkshire, including charges for recording ancestors in American Book.

ESSEX.

Animals recorded in the American Essex Record. Fees same as Yorkshire, including charges for recording ancestors in American Book.

POLAND CHINA.

Animals recorded in the following United States Poland China Records:—American, National, Southwestern, or Standard. Fees to members, 50 cents; to non-members, \$1. Annual membership, \$2.

CHESTER WHITE.

Animals recorded in the O.I.C. Record (United States). Fees same as Poland China.

DUROC JERSEY.

Animals recorded in the American Duroc Jersey Record, or in the National Duroc Jersey Record. Fees same as Poland China.

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HAMPSHIRE.

Animals recorded in the American Hampshire Record. Fees same as Poland China.

SHEEP.

SHROPSHIRE.

Animals recorded in the English Flock Book of Shropshire Sheep, or in the American Shropshire Sheep Record. Fees to members, 50 cents; to non-members, for animals imported from Great Britain, \$2; for animals bred in the United States, \$1. Annual membership fee to Dominion Sheep Breeders' Association, \$1.

LINCOLN.

Animals recorded in the Lincoln Longwood Sheep Breeders' Flock Book or in the American National Lincoln Sheep Breeders' Record. Fees to members, 50 cents; to non-members, \$1. Annual membership, \$1.

OXFORD DOWN.

Animals recorded in the English Oxford Down Flock Book or in the American Oxford Down Record. Fees same as Lincoln.

COTSWOLD.

Animals recorded in the English Cotswold Flock Book or in the American Cotswold Record. Fees same as Lincoln.

DORSET.

Animals recorded in the English Dorset Horn Flock Book or in the American Continental Dorset Club Record. Fees same as Lincoln.

SOUTHDOWN.

Animals recorded in the English Southdown Flock Book or in the American Southdown Record. Fees same as Lincoln.

HAMPSHIRE DOWN.

Animals recorded in the English Hampshire Down Flock Book or in the American Hampshire Down Flock Record. Fees same as Lincoln.

LEICESTER.

Animals recorded in the English Leicester Flock Book, the English Border Leicester Flock Book, or in the American Leicester Record. Fees same as Lincoln.

HIGHLAND BLACKFACE.

Animals imported from Great Britain from flocks recognized as pure bred. A certificate to this effect must be furnished certified by the secretary of the Blackface Sheep Breeders' Association. Fees same as Lincoln.

CHEVIOT.

Animals recorded in the English Cheviot Sheep Flock Book or in the American Cheviot Flock Book. Fees same as Lincoln.

SUFFOLK.

Animals recorded in the English Suffolk Flock Book or in the American Suffolk Sheep Record. Fees same as Lincoln.

CANADIAN QUARANTINE REGULATIONS.

Persons importing live stock from Europe to Canada will find it to their advantage to ship, whenever possible, by vessels arriving at Canadian ports, as animals shipped via United States ports are liable to serious delay at the boundary, unless all necessary requirements have been complied with and full information furnished beforehand, both to this office and to the Health Animals Branch of the Department of Agriculture.

EXTRACTS FROM QUARANTINE REGULATIONS.

Sec. 3.—The following Customs ports are hereby declared to be Animals' Quarantine Stations, and all animals imported into Canada subject to quarantine must be entered through said stations, viz.:—Halifax, N.S.; St. John and McAdam Junction, N.B.; Charlottetown, P.E.I.; Sherbrooke and St. Johns, Que.; Bridgeburg, Windsor, Sarnia, Sault Ste. Marie and Fort Frances, Ont.; Emerson, Gretna and Bannerman, Man.; North Portal, Wood Mountain, Big Muddy and Willow Creek, Sask.; Pendant d'Oreille, Coumts and Twin Lakes, Alta.; Gateway, Kingsgate, Rossland, Nelson, Grand Forks, Midway Myneaster, Osyoos, Keremeos, Huntingdon, New Westminster, White Rock, Vancouver and Victoria, B.C.; Whitehorse, Y.T. Quebec is also declared to be an Animals' Quarantine Station in so far as importations into Canada by sea are concerned.

Sec. 4.—Animals subject to inspection only, but which are not subject to quarantine, may enter through the aforesaid and at the following ports:—Pictou, North Sydney and Yarmouth, N.S.; St. Stephens, Woodstock, Edmunston, Grand Falls, St. Leonards, Debec Junction, Florenceville and Aroostook Junction, N.B.; Comin's Mills, Lake Megantic, Coaticooke, Beebe Junction, Highwater, Abercorn, St. Armand, Lacolle Junction, Noyan Junction, Athelstan, Dundee and St. Agnes de Dundee, Que.; Cornwall, Prescott, Morrisburg, Brockville, Kingston, Cobourg, Toronto, Niagara Falls, Port Arthur, Rainy River, Ont.; Snowflake, Man.; Marienthal, Sask.; Rykerts, Nanaimo and Bridesville, B.C.

IMPORTATIONS IN GENERAL.

Sec. 6.—The Minister may prohibit or regulate the importation of animals from any country or any district where he has reason to believe that contagious disease of animals exists.

Sec. 7.—(a) Persons contemplating the importation of animals from any part of the world, except the United States and Newfoundland, must first obtain from the Minister a permit therefor. Such permits shall not be available at any port other than the one mentioned therein.

(b) Applications for such permits shall be in writing, and shall state the number and kind of animals for which the permit is applied, the country of origin and probable date of shipment, the port of embarkation, the port at which the animals are to be landed and the approximate date of their arrival. The statements contained therein may be required to be verified on oath, the Minister deciding in every case whether a permit will be granted.

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(c) Animals from countries other than those above mentioned arriving at any port in Canada without such permit shall not be admitted to Canada unless and until ordered by the Minister.

(d) Unless otherwise ordered by the minister, the provisions of this section shall not apply to the importation of horses from any of the other countries of Europe.

Sec. 8.—The importation by sea into Canada of animals from all countries, other than the United States, Newfoundland and Mexico, is prohibited except at the ports of Victoria and Vancouver, B.C.; Quebec, Que.; St. John, N.B.; Halifax, N.S.; Charlottetown, P.E.I., and such other ports as may hereafter be indicated by the Minister.

Sec. 9.—Animals imported via United States ports must be accompanied not only by the necessary health certificates from the country of origin, but also by a certificate of quarantine or inspection signed by a veterinary inspector of the United States Bureau of Animal Industry.

Sec. 11.—All importers must certify under oath, before making Customs entry, the place of origin of the animals imported by them.

Sec. 12.—All animals arriving in Canada through any of the above mentioned ports on the Canadian seaboard shall be subject to inspection on arrival by inspectors who may, from time to time, be appointed for that purpose.

Sec. 13.—All inspections of imported animals must be made in day-light.

Sec. 16.—Importers of animals will be required to certify under oath that the health certificates referred to in these regulations apply to the said animals and to no other, and that the district named is the actual one from which these animals came.

Sec. 17.—Any unauthorized interference with animals after inspection, whether by substitution or otherwise, or any evasion, or misrepresentation will be deemed a breach of these regulations, and in addition will render the shipment liable to seizure and detention pending the orders of the Minister as to its disposal.

Sec. 19.—No person shall import or introduce, or attempt to import or introduce, into Canada any animal contrary to these regulations or which is affected with any contagious or infectious disease, and any animal which is imported or introduced, or attempted to be imported or introduced, into Canada contrary to these regulations or which is affected with or suspected of being affected with any contagious or infectious disease, may be forthwith destroyed, refused admission to Canada, or otherwise disposed of as the Veterinary Director General may direct.

HORSES, MULES AND ASSES.

Sec. 23.—Horses, mules and asses imported from countries other than the United States, Newfoundland and Mexico, must be accompanied by the certificate of a qualified veterinarian and of the local authority of the district whence they came, that no glanders, *maladie du coït* or other serious infectious or contagious disease affecting horses has existed in said district for a period of six months prior to their shipment.

Sec. 24.—Horses, mules and asses imported from countries other than the United States, Newfoundland and Mexico, consigned to Montreal, may be, unless otherwise ordered by the Minister, inspected at that port. Such animals landing at any of the other ports named shall be inspected at such ports.

CATTLE.

Sec. 25.—Cattle imported from countries other than the United States, Newfoundland and Mexico, must be accompanied by the certificate of a qualified veterinarian and of the local authority of the district whence they came, that no contagious pleuro-pneumonia, rinderpest or foot and mouth disease has existed in said district for a period of six months prior to their shipment.

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Sec. 26.—(a) A quarantine of thirty days shall be enforced upon cattle imported from the United Kingdom, to be counted from the date of arrival at the quarantine station.

(b) A quarantine of ninety days shall be enforced upon cattle imported from all other countries except the United States, Newfoundland and Mexico, to be counted from the date of clearance of the vessel carrying the same from the port at which they were embarked.

OTHER RUMINANTS.

Sec. 27.—Sheep and goats imported from countries other than the United States, Newfoundland and Mexico, must be accompanied by the certificate of a qualified veterinarian and of the local authority of the district whence they came, that no foot and mouth disease has existed in said district for a period of six months prior to their shipment.

Sec. 28.—A quarantine of thirty days shall be enforced upon all sheep and goats imported from countries other than the United States, Newfoundland and Mexico, to be counted from the date of clearance of the vessel carrying the same from the port at which they were embarked.

SWINE.

Sec. 29.—Swine imported from countries other than the United States, Newfoundland and Mexico, must be accompanied by the certificate of a qualified veterinarian and of the local authority of the district whence they came, that no hog cholera, swine plague or foot and mouth disease has existed in said district for a period of six months prior to their shipment.

Sec. 30.—A quarantine of thirty days shall be enforced upon all swine imported from countries other than the United States, Newfoundland and Mexico, to be counted from the date of clearance of the vessel carrying the same from the port at which they were embarked.

IMPORTATION OF ANIMALS FROM THE UNITED STATES, NEWFOUNDLAND AND MEXICO.

Sec. 31.—All animals imported into the Dominion of Canada from the United States, Newfoundland and Mexico, must be accompanied by a statutory declaration or affidavit made by the owner or importer, stating clearly the purpose for which said animals are imported, viz.:—Whether for breeding purposes, for milk production, for work, for grazing, feeding or slaughter, or whether they form part of settlers' effects, or whether they are entered for temporary stay, as provided by these regulations.

Sec. 32.—Said declaration or affidavit must be presented to the Collector of Customs at the port of entry, who will decide whether the animals are entitled to entry under these regulations, and who will notify the veterinary inspector of the Department of Agriculture in all cases where the regulations require an inspection to be made.

ANIMALS FROM THE UNITED STATES.

HORSES, MULES AND ASSES.

Sec. 33.—The importation of branded or range horses, mules and asses, other than those which are gentle and broken to harness or saddle, is prohibited.

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Sec. 34.—Horses, mules or asses, shall be inspected, and if so ordered by the Minister, may be detained, isolated, dipped, or otherwise treated, or in default of such order, where the inspector has reason to believe or suspect that the animals are affected with, or have been exposed to contagious or infectious disease.

Sec. 35.—Horses, mules and asses must be accompanied by:—

(a) A satisfactory certificate of mallein test dated not more than thirty days prior to the date of entry, and signed by an inspector of the United States Bureau of Animal Industry; or,

(b) A similar certificate from a reputable veterinarian, provided such certificate is endorsed by an inspector of the said Bureau of Animal Industry; or,

(c) A similar certificate from an inspector of the Canadian Department of Agriculture.

When not so accompanied, such horses, mules or asses must be submitted to the mallein test either at the quarantine station where entry is made, or, under such restrictions as the Veterinary Director General may prescribe, at point of destination.

Sec. 36.—When tested at the port of entry, if any reactors are found they shall be slaughtered without compensation, or definitely marked and returned to the United States, and must not again be presented for entry. All horses, mules or asses in the same consignment shall be returned to the United States, but the non-reactors may be again presented for entry and further test after the lapse of a period of not less than fifteen days from the date of the first test, provided that satisfactory evidence is produced to the effect that they have not, during the said period, been in contact with affected animals. When tested at destination points all animals reacting to the test will be slaughtered without compensation, while those comprising the rest of the shipment will be detained in quarantine until it is shown to the satisfaction of the Veterinary Director General that they are free from disease.

Sec. 37.—No compensation will, under any circumstances, be paid for horses reacting to mallein within six months after the date of their importation into Canada.

CATTLE.

Sec. 38.—All cattle shall be inspected, and if so ordered by the Minister, may be detained, isolated, submitted to the tuberculin test, dipped or otherwise treated, or in default of such order, where the inspector has reason to believe or suspect that animals are affected with or have been exposed to contagious or infectious disease.

Sec. 39.—Cattle for breeding purposes and milk production six months old or over, if unaccompanied by a satisfactory tuberculin test chart dated not more than thirty days prior to the date of entry and signed by a veterinarian of the United States Bureau of Animal Industry, must be detained in quarantine for one week or such further period as may be deemed necessary, and subjected to the tuberculin test; cattle reacting thereto must be returned to the United States or slaughtered without compensation.

Sec. 40.—Importers may be required to furnish a statutory declaration that the chart produced applies to the cattle it purports to describe and no other.

OTHER RUMINANTS.

Sec. 41.—All sheep and goats shall be inspected, and, if so ordered by the Minister, may be detained, isolated, dipped or otherwise treated, or, in default of such order, where the inspector has reason to believe or suspect that the animals are affected with or have been exposed to contagious or infectious disease.

SWINE.

Sec. 42.—All swine must be accompanied by a certificate signed by a veterinarian of the United States Bureau of Animal Industry, stating that neither swine plague nor hog cholera has existed within a radius of five miles of the premises in which they have been kept for a period of six months immediately preceding the date of shipment, but such swine shall nevertheless be inspected, and shall be subjected to a quarantine of thirty days before being allowed to come in contact with Canadian animals.

ANIMALS FOR EXHIBITION.

Sec. 43.—Animals other than swine may be admitted at quarantine and inspection ports only, for purposes of exhibition or other temporary stay, subject to the usual Customs regulations.

ANIMALS FOR TRANSIT THROUGH CANADA.

Sec. 45.—The transit of such animals shall be subject to such regulations as the Minister shall, from time to time, prescribe.

ANIMALS FROM MEXICO.

Sec. 46.—Any person contemplating the importation of animals from Mexico must, in addition to all other requirements of this order, first obtain from the Minister a permit therefor.

Applications for such permits shall be in writing, and shall state the number and kind of animals to be imported, the district and state in Mexico whence they are to be shipped and the probable date of their arrival at and the name of the Canadian port of entry. The statements contained therein may be required to be verified on oath, the Minister deciding in every case whether a permit will be granted.

MEXICAN ANIMALS BONDED THROUGH UNITED STATES TERRITORY FOR ADMISSION TO CANADA.

Sec. 47.—Animals passing in bond through United States territory for importation into Canada must be accompanied by a certificate of health signed by a veterinarian of the United States Bureau of Animal Industry, and by an affidavit from the owner or importer that the said certificate refers to the animals in question. Such animals shall nevertheless be subject to inspection, and if necessary to detention, before being permitted to enter Canadian territory. If found diseased such animals are to be subject to and dealt with according to the orders of an inspector under instructions from the Veterinary Director General.

HORSES, MULES AND ASSES.

Sec. 48.—The importation of branded or range horses, mules and asses other than those which are gentle and broken to harness or saddle is prohibited.

Sec. 49.—All horses, mules and asses shall be inspected and shall be submitted to the mallein test before being allowed to enter Canada. If any reactors are found they shall be slaughtered without compensation.

CATTLE.

Sec. 50.—All cattle shall be inspected and if so ordered by the Minister may be detained, isolated, submitted to the tuberculin test, dipped or otherwise treated, or, in default of such order where the inspector has reason to believe or suspect that animals are affected with or have been exposed to contagious or infectious disease.

OTHER RUMINANTS.

Sec. 51.—All sheep and goats shall be inspected, and if so ordered by the Minister may be detained, isolated, dipped or otherwise treated, or, in default of such order, where the inspector has reason to believe or suspect that the animals are affected with or have been exposed to contagious or infectious disease.

SWINE.

Sec. 52.—All swine shall be inspected and shall be subjected to a quarantine of sixty days before being allowed to come in contact with Canadian animals.

ANIMALS FROM NEWFOUNDLAND.

Sec. 53.—All animals imported from Newfoundland shall be inspected and if so ordered by the Minister, may be detained, isolated, tested, dipped or otherwise treated, or, in default of such order, where the inspector has reason to believe or suspect that animals are affected with or have been exposed to contagious disease.

REGULATIONS OF QUARANTINE.

Sec. 55.—Animals in any quarantine station shall be treated and dealt with under the direction of the superintendent of the said station and all articles used for, about or in connection with the said animals shall be in like manner subject to his direction and supervision.

Sec. 56.—Cattle six months old or over imported from countries other than the United States, Newfoundland and Mexico, shall not be discharged from quarantine until they have been submitted to the tuberculin test by the superintendent of the quarantine or other duly authorized office.

Sec. 57.—Cattle reacting to the tuberculin test, but not showing clinical symptoms, shall be permanently marked in the right ear with the letter 'T' by the officer making the test, and may then be released at the expiry of the prescribed period of quarantine if found free from all other infectious or contagious diseases.

Sec. 58.—Cattle showing clinical symptoms of tuberculosis shall be destroyed or otherwise disposed of as the Minister may direct.

Sec. 59.—The Minister or the Veterinary Director General may authorize the destruction of any quarantined animal or all or any portion of the articles used in the care of the said animals, and such destruction shall take place under the supervision of the superintendent, and in the manner prescribed by him.

Sec. 60.—The expenses of feeding, treating and caring for animals detained in quarantine, with the exception of those for the use of grounds and shelters, shall be borne by the owner or importer, and such expenses shall be paid before the animals are permitted to leave the quarantine, and in default of such payment within four-

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teen days after the expiration of the period of quarantine, the superintendent may on fourteen days' notice in writing, delivered or sent by mail to the owner or importer, cause the said animals to be sold to meet the said expenses, together with the expenses of and incidental to the sale of the said animals, the balance, if any, to be handed over to the owner.

Sec. 61.—No animal under quarantine shall be allowed to come in contact with any Canadian animal until duly discharged from quarantine.

Sec. 62.—No animal under quarantine shall be removed from a quarantine station until duly discharged therefrom by the superintendent or other duly authorized officer.

Sec. 63.—No person shall remove or attempt to remove any animal from a quarantine station without the authority of the superintendent or other duly authorized officer.

Sec. 64.—No indemnity shall be allowed for any injury or loss sustained in connection with any animals while detained in quarantine.

UNITED STATES REGULATIONS GOVERNING THE FREE ADMISSION OF CANADIAN BRED ANIMALS FOR BREEDING PURPOSES.

Previous to January 1, 1911, animals for breeding purposes when imported by citizens of the United States were given free customs entry when recorded in United States books of record and import certificates issued by United States record associations presented to collectors at the point of entry into the United States. Since January 1 animals are admitted on certificate of pure breeding issued from the Bureau of Animal Industry at Washington. The following are extracts from the United States Regulations B.A.I., Order 175:—

REGULATION 1.—CERTIFICATION OF PUREBRED ANIMALS.

SECTION 2. *How to Obtain Certificates.*—In order to obtain such certificates of pure breeding, importers shall conform to the following procedure:

Paragraph 1. *Application for Certificates.*—An application for certificates shall be made to the Bureau of Animal Industry on forms furnished or approved by the Department showing the number of animals to be imported, the breed and sex, the port of shipment, the port of entry into the United States, the name of vessel by which shipped, and the probable date of arrival. This application may be signed either by the owner, the importer, or the agent, stating the name and address (in the United States) of the owner of the animal or animals.

Paragraph 2. *Certificates of Pedigree.*—Certificates of registration and pedigree for said animal or animals, issued by the custodian of one of the books of record given in regulation 2, section 4, of this order, shall be furnished to the Bureau of Animal Industry with the application.

Paragraph 3. *Vendor's Certificates.*—A certificate from the seller or his agent shall be furnished to the Bureau of Animal Industry with the application, giving the name and registry number of each animal sold to the importer, the date of sale, the place of purchase, and the name and address (in the United States) of the purchaser. Vendor's certificates furnished by the custodians of foreign books of record, containing the above information, may be used; otherwise, the form of vendor's certificate furnished or approved by this department must be used.

SECTION 3. Applications will be given consideration by the department in the order in which they are received. When the application and accompanying papers are satisfactory, certificates to that effect will be issued promptly and forwarded to the inspector of the Bureau of Animal Industry at the port of entry or at the station

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where the animals are quarantined, which officer will compare the animals imported with the data furnished in the foreign pedigree certificates and where satisfactory, both the foreign pedigree certificates and the certificates of the Bureau of Animals Industry will be given to the owner, importer, or agent. All papers for animals which do not meet the requirements of this order will be retained or returned in the discretion of the department.

SECTION 4. *Eligibility of Animals*.—Where the provisions of this order have been otherwise complied with, animals will be certified as purebred which have been fully registered in good faith in one of the books of record for one of the recognized breeds given in regulation 2, section 4, of this order, except those which have been registered on inspection.

(NOTE.—See amendments to this section below).

REGULATION 2.—CERTIFICATION OF RECOGNIZED BREEDS.

SECTION 4, paragraph 2.—*Recognized Breeds and Books of Record in Canada*.—The Canadian National Records are recognized for the following breeds, subject to the same provisions prescribed for books of record across the seas:—

HORSES.	SHEEP.
Belgian Draft.	Cheviot.
Clydesdale.	Cotswold.
Hackney.	Dorset Horn.
Shire.	Hampshire.
Suffolk.	Hampshire.
Welsh Pony and Cob.	Leicester.
Standard Bred	Lincoln.
	Oxford Down.
	Shropshire.
	Southdown.
	Suffolk.
CATTLE.	HOGS.
Aberdeen-Angus.	Berkshire.
Ayrshire.	Duroc-Jersey.
French Canadian.	Poland-China
Galloway.	Tanworth.
Guernsey.	Yorkshire.
Hereford.	
Jersey.	
Red Polled.	
Shorthorn.	

AMENDMENT 1 TO B.A.I ORDER 175.

MODIFYING PARAGRAPH 2, SECTION 4, REGULATION 2, REGARDING THE RECOGNITION OF ANIMALS REGISTERED IN THE CANADIAN NATIONAL RECORD.

Effective on and after January 1, 1911.

Paragraph 2, section 4, regulation 2, of the regulations issued by the Secretary of Agriculture, under date of November 25, 1910, regarding the recognition of specified breeds of horses, cattle, sheep and hogs registered in the Canadian National Records, is hereby modified so as to provide that no animal or animals registered in the Canadian National Records shall be certified by the Secretary of Agriculture as purebred, except those which trace, in all crosses, to registered animals in the country where the breed originated.

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AMENDMENT 4 TO B.A.I. ORDER 175.

MODIFYING REGULATION 2, SECTION 4, PARAGRAPH 2, AND AMENDMENT 1 REGARDING THE RECOGNITION OF ANIMALS REGISTERED IN THE CANADIAN NATIONAL RECORDS.

Effective on and after June 1, 1911.

Regulation 2, section 4, paragraph 2, of the regulations issued by the Secretary of Agriculture under date of November 25, 1910, and amendment 1, thereto issued December 30, 1910, regarding the recognition of specific breeds of horses, cattle, sheep and hogs registered in the Canadian National Records is hereby modified so as to provide that no animal or animals registered in the Canadian National Records shall be certified by the Secretary of Agriculture as pure bred except those which trace, in all their crosses, to registered animals in the country where the breed originated, or to animals which are proved to the satisfaction of the department to be of the same breed and that have been imported into the United States or Canada from the country in which the breed originated.

ONLY CITIZENS OF THE UNITED STATES MAY IMPORT FREE OF DUTY.

(Extracts from United States Treasury Department Regulations.)

IMPORTATION OF ANIMALS FOR BREEDING PURPOSES.

Beginning January 1, 1911, there will be required, in order to obtain the free entry of animals imported for breeding purposes under paragraph 492 of the Tariff Act of August 5, 1909, evidence as follows:—

1. The affidavit of the importer that he is a citizen of the United States and that the animals are imported specially for breeding purposes. This affidavit will be considered in connection with the circumstances of the importation, and any further evidence required which the collector may deem necessary to establish the allegations.

The fact that the animals are pure bred, or a recognized breed, and accompanied by proper certificate, establishes their status as breeding animals. The use of such animals incidentally for driving or working is not inconsistent with the requirements for free duty.

2. A certificate from the Department of Agriculture, stating that the animals are pure bred, of a recognized breed, and duly registered in the foreign book of record established for that breed. With this certificate there must also be produced and submitted to the collector the certificate of record and pedigree on which the certificate of the Department of Agriculture is based, together with the affidavit of the owner, agent, or importer that such animals are identical with those described in the said certificate.

In case any of the foregoing evidence can not be furnished at the time of the arrival of the animals, a voluntary bond may be given by the importer in double the amount of the estimated duties, conditioned for the production of the required evidence within six months, which bond may be extended in exceptional cases for a like period on application to the secretary of the treasury, and shall be cancelled only upon the production of the evidence for which it is given or upon payment of full liquidated duties. Should the importer so elect, estimated duties may be paid and a written stipulation filed with the collector within 10 days thereafter to produce the evidence within six months from the date of entry, whereupon the final liquidation will be suspended until the production of the evidence or the expiration of the six months.

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It will be observed from the foregoing that only citizens of the United States may import animals free of duty and that only such animals as trace in all their crosses to registered animals in the country where the breed originated, or to animals which are proved to the satisfaction of the Department of Agriculture, Washington, to be of the same breed and that have been imported into the United States or Canada from the country in which the breed originated.

The Bureau of Animal Industry at Washington furnishes form of vendor's certificate and form on which to make application for certificate of pure breeding. An export certificate embracing these forms may be procured from the Canadian National Record Office. If application for export certificate is made the same must be accompanied by an application for the transfer of ownership to the United States purchaser.

If further information is required, communicate with the Canadian National Records, Ottawa, Canada.

EXTRACTS FROM REGULATIONS FOR THE INSPECTION AND QUARANTINE OF HORSES, CATTLE, SHEEP, SWINE AND OTHER ANIMALS IMPORTED INTO THE UNITED STATES.

GENERAL PROVISIONS.

PORTS OF IMPORT AND QUARANTINE AND INSPECTION STATIONS.

Regulation 1.—With the approval of the secretary of the Treasury, the following-named ports, sub-ports, and customs stations are hereby designated as quarantine stations, and all horses, cattle, sheep, and other ruminants, and swine imported into the United States and which are subject to both quarantine and inspection must be entered through said stations, viz.: On the Atlantic seaboard, Boston, Mass., New York, N.Y., and Baltimore, Md. On the Pacific seaboard: San Francisco and San Diego, Cal., and Port Townsend, Wash. Along the boundary line between the United States and Mexico: Campo and Calexico, Cal., Nogales, Ariz., El Paso, Eagle Pass, Laredo, Rio Grande City, Edinburg, and Brownsville, Tex. Along the border or boundary line between the United States and Canada: Vanceboro, Houlton, Van Buren and Fort Fairfield, Me.; also Lowelltown, Me., (port of Bangor, Me.), for a part of each year beginning August 15 and continuing during the months of September, October and November (Aug. 15 to Nov. 30, inclusive); Beecher Falls, Island Pond, Newport, Richford, St. Albans, and East Alburg, Vt.; Rouses Point, Hogansburg, Massena, Ogdensburg, Cape Vincent, Clayton, Charlotte, Niagara Falls, and Buffalo, N.Y.; Detroit, Port Huron and Sault Ste. Marie, Mich.; and Pembina, N. Dakota.

The following named stations are designated for the entry of animals which are subject to inspection, but not to quarantine, viz.: Eastport and Calais, Me.; Derby Line, North Troy, Alburg and Swanton, Vt.; Mooers Junction, Chateaugay, Fort Covington, Malone, Waddington, Morristown, Lisbon and Alexandria Bay, N.Y.; Blaine, Sumas and Seattle, Wash.

PAPERS BY UNITED STATES CONSULS.

Regulation 12.—United States consuls should give clearance papers or certificates for animals from their districts intended for exportation to the United States only upon presentation of permits as above provided with dates of probable arrival and destination corresponding with said permits, and in no case for a number in excess of that mentioned therein. When such shipments originate in the interior of a foreign country these permits should be submitted to the consul of that district and through the following agent to the consul at the port of embarkation.

CANADA.

AFFIDAVIT TO ACCOMPANY ANIMALS.

Regulation 35.—All animals imported into the United States from the Dominion of Canada shall be accompanied by an affidavit made by the owner or importer, declaring clearly the purpose for which said animals are imported, viz., whether for breeding purposes, for milk production, for work, for grazing, feeding, or slaughter, or whether they form part of settlers' effects, or whether they are horses entered for temporary stay, as provided by regulation 36. Said affidavits shall be presented to the collector of customs at the port of entry, who will decide whether the animals are entitled to entry under these regulations, and who will notify the inspector of the Bureau of Animal Industry in all cases where the regulations require an inspection to be made.

HORSES.

Regulation 36.—Horses for breeding, racing, show, and sale purposes, for grazing or for work, shall be inspected at the port of entry, and when so ordered by the chief of the Bureau of Animal Industry must be accompanied by a satisfactory certificate of mallein test signed by an official Canadian veterinarian or by an inspector of the Bureau of Animal Industry. Those belonging to the Indian tribes and settlers or immigrants and those used in connection with stock raising (cow ponies) or mining, and those for temporary stay at points along the frontier not exceeding two weeks, whether for pleasure, driving, or teaming, shall be required to pass a veterinary inspection at the port of entry by an inspector of the Bureau of Animal Industry; or they may be admitted without inspection upon written permission from the Secretary of Agriculture first had and obtained; Provided, however, That neither inspection by an inspector of the Bureau of Animal Industry nor written permission from the Secretary of Agriculture shall be required for Canadian horses for pleasure, driving, or teaming, whether driven or ridden into the United States for a temporary stay not to exceed three days. The same rule will apply to American horses returning to the United States from Canada after a stay in Canada not to exceed three days. Horses admitted in bond for export from the United States shall be subject to inspection at any point at which this department has inspectors stationed.

CATTLE.

Regulation 37.—Cattle for breeding purposes, milk production, grazing or feeding must be inspected and must be accompanied by a certificate signed by a Canadian Official veterinarian, stating that no contagious disease affecting cattle, except tuberculosis and actinomycosis, has existed in the district in which the animals have been kept for six months preceding the date of importation. The owner must present an affidavit that said certificate covers the cattle in question.

TUBERCULIN TEST FOR CATTLE.

Regulation 38.—Cattle over 6 months old for breeding purposes and milch cows shall also be accompanied by a satisfactory certificate of tuberculin test (which test shall have been made within 30 days of the date of importation by a veterinarian in the employ of and receiving a salary from the Canadian government or by an inspector of the Bureau of Animal Industry), giving the date and place of testing and a description of the cattle, with the age and markings.

CATTLE FOR EXHIBITION PURPOSES.

Regulation 39.—The Chief of the Bureau of Animal Industry may, however, by written order, waive the foregoing tuberculin-test requirement for cattle which are to

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be imported temporarily for exhibition purposes, provided such cattle are accompanied by a satisfactory certificate of tuberculin test by a veterinarian in the employ of and receiving a salary from the Canadian Government made not more than six months previously and an affidavit by the owner or importer stating that the said certificate of tuberculin test refers to the cattle in question. Any such cattle which are not sold to remain in the United States shall be returned immediately to Canada at the close of the exhibition. The department must be notified of any Canadian cattle which will remain in the United States, not tested as required by Regulation 38, and the tuberculin test will be applied to them by an inspector of this department before shipment to destination. All cattle, sheep and swine intended for exhibition purposes must be shipped directly to the exhibition grounds and must not be unloaded in any public stockyards.

CATTLE QUARANTINE.

Regulation 40.—All cattle imported for breeding, milk production, grazing, or feeding, when not accompanied by the required affidavit or certificates, must be detained in quarantine for one week at the expense of the owner or importer, under the supervision of the inspector. During this detention a rigid inspection will be made and cattle for breeding or milk production which are over 6 months old will be tested with tuberculin. Animals found free from disease at the end of that period will be released.

INSPECTION OF CATTLE.

Regulation 41.—Cattle for slaughter shall be inspected. Those forming part of settlers' effects or belonging to Indian tribes may be admitted through any port without inspection or certification upon written permission of the Secretary of Agriculture first had and obtained. Cattle in bond for export may be admitted without inspection of any of the ports named in regulation 1, in transit to and for export from Portland, Me.; Boston, Mass.; New York, N.Y.; Philadelphia, Pa.; Baltimore, Md.; and Newport News and Norfolk, Va., subject to inspection at the port of export: Provided, that inspection may be required by the Secretary of Agriculture whenever, in his opinion, such inspection is necessary.

SHEEP.

Regulation 42.—All sheep imported into the United States from Canada for breeding, grazing, or feeding must be inspected at the port of entry by an inspector of the Bureau of Animal Industry. They must also have been inspected by a veterinarian in the employ of and receiving a salary from the Canadian government, and be accompanied by a certificate signed by him stating that he has inspected the sheep and found them free from disease, and that no contagious disease affecting sheep has existed in the district in which the animals have been kept for six months preceding the date of importation; stating also that they have been twice carefully dipped under his personal supervision, or under the personal supervision of another veterinarian in the employ of and receiving a salary from the Canadian government, in one of the dips approved by the Secretary of Agriculture, as described in regulation 33 of B.A.I. Order 143 as amended. The owner or importer shall present an affidavit that said certificate refers to the sheep in question: It is provided further: That any such sheep which are unaccompanied by the aforesaid certificate showing that they have been twice dipped, as herein prescribed, shall be subjected to a quarantine of 30 days.

SHEEP FOR SLAUGHTER, EXPORT, ETC.

Regulation 43.—Sheep for immediate slaughter and those belonging to Indian tribes or forming part of settlers' effects will be admitted at any port without inspection when accompanied by a certificate of an official veterinarian showing freedom

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from disease. Sheep in bond for export will be admitted without inspection when accompanied by such certificate at any of the ports mentioned in regulation 1, in transit to and for export from Portland, Me.; Boston, Mass.; New York, N.Y.; Philadelphia, Pa.; Baltimore, Md.; and Newport News and Norfolk, Va., subject to inspection at the port of export.

OTHER RUMINANTS.

Regulation 44.—Ruminants other than cattle and sheep shall be accompanied by affidavits similar to those required for cattle, and when not accompanied by said affidavits, relating to the kind of animals offered for importation, they shall be detained in quarantine one week, or for such period as may be necessary to determine whether or not they are free from disease.

SWINE.

Regulation 45.—All swine shall be subject to inspection and shall be accompanied by a certificate signed by a Canadian official veterinarian stating that no swine plague or hog cholera has existed within a radius of 5 miles of the premises in which they have been kept for a period of six months immediately preceding the date of shipment. The owner or importer must present an affidavit that the said certificate covers the swine in question. Swine not accompanied by affidavit and certificate will be subject to a quarantine of two weeks at the expense of the owner or importer, under the supervision of the inspector.

CARS TO BE CLEANED AND DISINFECTED.

Regulation 46.—The railroad cars used in the transportation of animals specified by these regulations must be thoroughly cleaned and disinfected before such animals are placed therein. All litter from previous shipments must be removed and the car cleaned and whitewashed with the following disinfectant:—

To make 5 gallons of disinfectant proceed as follows: Slake $7\frac{1}{2}$ pounds of lime, using hot water if necessary to start action. Make to a cream with water. Stir in 20 fluid ounces of cresol (commercially known as carbolic acid, liquid) at least 95 per cent pure, and make up to 5 gallons. Stir thoroughly. If to be applied through a spray nozzle, strain through a wire sieve. Stir frequently when applying, and keep covered when not in use.

The interior of the car must be completely covered with this mixture, a sufficient quantity being applied to saturate the woodwork thoroughly.

Unless this regulation is complied with, Canadian animals will not be allowed entry into the United States, and animals from the United States will not be admitted into Canada. The shippers should see that the cars are properly cleaned and disinfected before animals are loaded.

All of which is respectfully submitted.

A. W. SMITH, chairman,
WM. SMITH,
JOHN BRIGHT,
ROBERT MILLER,

N. GARNEAU,
J. E. BRETHOUR,
J. M. GARDHOUSE.
JNO. W. BRANT, secretary.

OTTAWA, CANADA, January 16, 1912.

APPENDIX No. 23.

FURTHER REPORT ON THE DOURINE OF WESTERN CANADA, PART I.

By E. A. WATSON, V.S., ASSISTANT PATHOLOGIST.

Contents.

The later history of twenty survivors of Dourine:—

I.—Introduction.

II.—Tolerant and naturally recovered mares with immunity against reinfection by 'covering-contact' with Dourine-infected stallions.

III.—Tolerant and naturally recovered mares with immunity against reinfection by 'covering-contact' and by direct inoculation.

IV.—Natural recoveries from naturally acquired infections.

V.—Natural recoveries from experimental infections.

INTRODUCTION.

My earlier reports have included mention of some cases of apparent recovery, acquired tolerance and immunity in mares surviving the disease. Such cases exist not only in the experimental herd of horses under observation and as will be described hereafter, but also, it cannot be doubted, among other herds or horses in districts where Dourine occurs. In the latter such cases are individually unknown and unsuspected for they offer not the slightest evidence of infection, and may be working, bearing offspring and living on in normal health and conditions, quite similarly, in fact, to those of the former which have been for years under close observation and whose history is well known and recorded. It cannot be stated for how many years or for what period of time such tolerant, recovered or immune animals remain as carriers of Dourine. They are not to be considered as so likely to spread the disease, as, for instance, the newly infected stallion, but they may be, at times, capable of infecting a susceptible stallion and thus serve as the starting point of a new centre of disease.

Dourine is one of a group of closely allied diseases caused by infection with certain species of trypanosomes all of which require for their perpetuation a so-called tolerant or immune carrier. Surra, for instance—that fatal disease of horses, mules and oxen of India and other hot countries, is carried by the more or less immune camel. In Africa it has been found that the trypanosomes of Nagana and allied diseases so fatal to domestic stock, especially imported animals, are harboured in the blood of big-game and the more or less immune native cattle, which thus acts as reservoirs for the virus needing only an insect intermediary for its further distribution. In Asia and Africa there may be insect hosts and carriers of Dourine that we know nothing of in this country, but here we know that all that is actually necessary for an apparently indefinite propagation of infection is merely the contact of two mucous surfaces provided the parasite is present in one of them; and further, evidence points to the tolerant or immune mare especially among native and lower breeds—which are far more resistant than highly bred imported animals—as one, at least, of the important carriers to be reckoned with.

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In any of the cases enumerated below, tolerance, recovery or immunity as it is indicated must be considered as naturally acquired, that is to say without the aid of any drug or medicinal treatment, for only such untreated cases have been included in this selection.

The "virus" or *Trypanosoma equiperdum* used for inoculation purposes and immunity tests was taken directly from infected horses, from plaques or other oedematous swellings, the 'ordinary strain' being from mares naturally infected, the strains of 'higher' and 'highest' virulence being from foals experimentally infected.

Four diseased stallions were used for covering and attempted reinfection, and each one of these died from the disease.

Acknowledgements.—Dr. J. G. Rutherford has shown much personal interest in these cases and it was on his suggestion and advice that the mares were tested (a) for the production of offspring and for sterility, (b) by allowing covering contact with the diseased stallions as one of the immunity-tests and (c) by breaking and putting them to the strain of steady, hard work in order to test their strength and usefulness and to see whether such measures would be inimical to their health and tolerance.

Dr. S. Hadwen is responsible for the events recorded for the period between September 15, 1905, and November 15, 1906.

II.—TOLERANT AND NATURALLY-RECOVERED MARES WITH IMMUNITY AGAINST REINFECTION BY 'COVERING-CONTACT' WITH DOURINE-INFECTED STALLIONS.

Mare 2.—Probable Time of Infective Covering, 'season of 1904.

- 1906.—Tolerant. Covered once by diseased stallion 31 (July). No symptoms.
- 1907.—Normal health. Covered once by diseased stallion 72 (August).
- 1908.—Normal health. Bred once to healthy stallion 30 (August).
- 1909.—Normal health. Birth of healthy foal.
- 1910.—Normal health. Not bred.
- 1911.—Normal health. Bred once to healthy stallion 30. Given hard work.
- 1912.—Normal health. March 31. The mare shows signs of pregnancy and, in the absence of any relapse or breaking down in health, has shown her ability to resist reinfection, bear offspring and to be usefully employed for work purposes.

Mare 3.—Probable Time of First Infective Covering, Season of 1904.

- 1906.—Tolerant. Covered 3 times by diseased stallions 31 and 33 (July). Slight vaginal discharge (August).
- 1907.—Normal health. Covered 3 times by diseased stallion 72 (August).
- 1908.—Normal health. Not bred. Employed at steady work.
- 1909.—Normal health. Bred to healthy stallion; continuing at work.
- 1910.—Normal health. Not bred. Worked for 3 months.
- 1911.—Normal health. Not bred. Worked for 3 months.
- 1912.—Normal health. March 31, the mare is now an aged animal, is non-productive of offspring, has shown her resistance to reinfection and usefulness as a hard and steady worker.

Mare 10.—Probable Time of First Infective Covering, Season of 1904.

- 1906.—Rapid recovery to normal conditions (May). Covered 5 times by diseased stallions 31 and 33 (June-October). No further symptoms.
- 1907.—Normal health. Covered 3 times by diseased stallion 72 (August-Sept.)
- 1908.—Normal health. Bred to healthy stallion.
- 1909.—Normal health. No offspring. Not bred. Broken to harness and work.

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- 1910.—Normal health. Employed as a driving animal for station work.
 1911.—Normal health. Employed as a driving animal for station work.
 1912.—Normal health. March 31, has indicated an unbroken immunity to reinfection, non-productiveness in offspring, but excellent enduring qualities as a roadster.

Mare 24.—Probable Time of First Infective Covering, Season of 1904.

- 1906.—Tolerant. Covered 7 times by diseased stallions 31 and 33 (June-August). Swollen vulva and discharge (September).
 1907.—Normal health.—Birth of healthy foal. Bred to healthy stallion.
 1908.—Normal health? Oedematous swelling (July). Bred to healthy stallion.
 1909.—Normal health. No symptoms. Birth of healthy foal. Bred to healthy stallion.
 1910.—Normal health. No offspring.
 1911.—Normal health to March 31.

REMARKS.—Conditions noted during 1908 may have been symptomatic of a brief and transient relapse.

III.—TOLERANT AND NATURALLY-RECOVERED MARES WITH IMMUNITY AGAINST RE-INFECTION BY 'COVERING-CONTACT' OR BY DIRECT INOCULATION.

Mare 9.—Probable Time of First Infective Covering, Season of 1904.

- 1906.—Tolerant. Vaginal changes still slightly symptomatic (?), April-June. Covered 7 times by diseased stallions 31 and 33 (July-September).
 1907.—No further symptoms or reactions. Normal time of inoculation of trypanosomes, ordinary strain, February 17. Local symptoms with trypanosome periodicity (May-June). Covered 3 times by diseased stallion 72 (August-September). Injection of serum of diseased stallion 72 (September 16). General symptomatic events and loss of health followed.
 1908.—Normal health regained.
 1909.—Normal health. No symptoms or relapsing condition.
 1910.—Normal health to April 3, when sudden death occurred from colic.

REMARKS.—A tolerance or immunity to 'covering-contacts' was broken by direct inoculation, but normal health was subsequently re-established and the degree of immunity probably raised.

Mare 13.—Probable Time of First Infective Covering, Season of 1904.

- 1906.—Tolerant, or recovered. Covered once by diseased stallion 31 (July 1). Normal health.
 1907.—Normal health. Bred to healthy stallion 30 (July 21 and 24).
 1908.—Normal health and pregnancy. Foaled, and bred again to stallion 30 (July 27).
 1909.—Normal health and pregnancy. Foaled, and bred again to stallion 30 (September 10). Inoculation of trypanosomes, highest virulence (September 14). Fever and loss in weight (October), and rapid recovery to normal health (December).
 1910.—Normal health. Given the strain of heavy work for 3 months.
 1911.—Normal health. Steady work throughout the year.
 1912.—Normal health. Continuing at work.

REMARKS.—Immunity to 'covering-contact' after a lapse of 3 years was broken for a brief period by direct inoculation of a strain of highest virulence. Tolerance and normal conditions were quickly regained and the degree of immunity probably raised.

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Mare 17.—Probable Time of First Infective Covering, Season of 1094.

- 1906.—Tolerant or recovered. (1) Covered once by diseased stallion 33 (July 6). Normal health.
- 1907.—Normal health. (2) Inoculation of trypanosomes, ordinary strain (May 27). No reactions. (3) Inoculation of trypanosomes, mixed strains (October 12). No reactions.
- 1908.—Normal health. Bred to healthy stallion 30 (August 5).
- 1909.—Normal health. (4) Inoculation of trypanosomes, higher virulence (February 4). (5) Inoculation of trypanosomes, highest virulence (May 21). Gave birth to a healthy foal (June 30).
- 1910.—Normal health. Broken to work.
- 1911.—Normal health. Put to the strain of steady and severe work.
- 1912.—Normal health to date, March 31.

REMARKS.—Recovery and immunity strikingly maintained against five attempts at reinfection. The fourth and fifth attempts were made during the period of pregnancy but were not successful in producing either abortion or symptomatic conditions.

Mare 7.—Probable Time of First Infective Covering, Season of 1904.

- 1906.—Tolerant. Bred to healthy stallion 30 (October 10).
- 1907.—Normal health. Not pregnant. Inoculation of trypanosomes, ordinary strain, (February 22). Bred to healthy stallion 30 (September 18).
- 1908.—Normal health. Not pregnant. Bred to healthy stallion 30 (August 3).
- 1909.—Normal health. Not pregnant. Inoculation of trypanosomes, higher virulence (May 21).
- 1910.—Normal health. Put to the test of breaking to work.
- 1911.—Normal health. Mare was destroyed in consequence of a broken leg and injuries sustained in accident during work.

REMARKS.—Inoculation failed to break the immunity by the slightest symptomatic reaction or disturbance of health. Always non-productive of offspring, this mare, after breaking to harness, proved a good worker; the teamster driving her for nearly one year reported her as one of the best work animals in his charge and the easiest to keep in good flesh and condition.

Mare 48.—Probable Time of First Infective Covering, Season of 1906, April or May.

- 1907.—Tolerant. Recovery was indicated at end of year.
- 1908.—Normal health. Inoculation of trypanosomes, ordinary strain, (Dec. 5).
- 1909.—Normal health. Inoculation of trypanosomes, higher virulence (Feb. 4).
- 1910.—Normal health. Broken to saddle and put to the test of hard work.
- 1911.—Normal health. Driven in harness at steady and hard work.
- 1912.—Normal health. Continuing at work as one of the Expt. station's best drivers.

REMARKS.—Recovery and immunity appears to be well maintained. The mare has exceptional strength and endurance and is an easy animal to keep in good flesh and working condition. Although health is given above as normal it should be mentioned that all through the period of observation, 1907-1912, an abnormal and almost constant sexual excitement has been noted, and at times the mare is nymphomaniacal. The vaginal tract has been frequently searched for trypanosomes but never with success.

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IV.—NATURAL RECOVERIES FROM NATURALLY-ACQUIRED INFECTIONS IN MARES.

Mare 75.—Probable Time of First Infective Covering, Season of 1906.

- 1907.—Typical local symptoms of Dourine. Little disturbance of health (September). Trypanosomes frequently present in vaginal secretions (September and October).
 1908.—Health and conditions variable. Rapid decline in health and loss in flesh following parturition, then rapid recovery to normal.
 1909.—Normal health (March-December).
 1910.—Normal health.
 1911.—Normal health. Broken to harness and put to strain of hard work.
 1912.—Normal health. No relapse during or following the period of one year's steady and severe work, ending March 31.

REMARKS.—The period of intermittent disease was 2—2½ years, recovery is of 4 years standing. This animal is nervous and highly excitable, and though a good worker is difficult to keep up in flesh and condition.

Mare 82.—Probable Time of First Infective Covering, Season of 1906.

- 1907.—Typical local symptoms with periodicity of trypanosomes (September-November).
 1908.—Slight and rare symptoms. Last appearance of trypanosomes (February 3). Becoming tolerant. Health and condition only little below normal.
 1909.—Normal health.
 1910.—Normal health.
 1911.—Normal health. Broken to harness and heavy wagon-work (March 23).
 1912.—Normal health. Returned in fair condition after nearly one year of hard and steady work (March 31).

REMARKS.—The period of disease appears to have terminated about two years after first infective covering. The duration of recovery is three years.

Mare 21.—Probable Time of First Infective Covering, Season (1904) or 1905.

- 1905.—No marked symptoms. Tolerant (September 15).
 1906.—No marked symptoms. Ovaricectomy performed (September 15) (Warnock and Hadwen).
 1907.—Recurrence of local symptoms (July-August), with sexual desire marked.
 1908.—Normal health.
 1909.—Normal health. Broken to saddle and employed for range work (September 28).
 1910.—Normal health. Six months range work.
 1911.—Normal health. Six months in range harness.
 1912.—Normal health. Returned in good condition (March 31).

REMARKS.—The period of active disease appears to have been a very short one. The second year was one of marked tolerance. During the third there was a recurrence of local symptoms. The period of recovery without a relapse is 4 years. The mare is a useful work animal but does not show much endurance for long or hard work, and is difficult to keep up in good condition.

Mare 25.—Probable Time of First Infective Covering, Season of 1905.

- 1906.—In advanced state of Dourine, paralysis, emaciation, &c. (February 20). Inco-ordination and paralytic conditions so marked that mare is scarcely able to be moved (December).

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1907.—No change in condition; death often looked for (January-March). Commencing improvement (April), and gradual recovery.

1908.—Some loss of control of limbs still noted. General health is fair.

1909.—Fair health and condition. Slight loss of control.

1910.—Fair health and condition.

1911.—Fair health and condition.

1912.—Fair health and condition.

REMARKS.—Period of disease appears as about two years. Recovery of general health and good body condition has been maintained for four years. A slight inco-ordination or uncertain gait remains to indicate that a part of the lesions of the nervous system are permanent or beyond repair.

V.—NATURAL RECOVERIES FROM EXPERIMENTAL INFECTIONS.

Filly 26.—Two years old.

1906.—November 21-December 3. Inoculations of blood of diseased stallion 33.

1907.—Variable health. No definite symptoms. Infection in doubt.

1908.—Fair general health.—Typical local symptoms of Dourine—'a plaque'—August 28, with trypanosomes present in contents.

1909.—Normal health. No relapse or symptomatic event. Bred to healthy stallion.

1910.—Normal health. No relapse or symptomatic event. Birth of healthy foal.

1911.—Normal health. Broken to harness and put to the test of hard work.

1912.—Normal health. Continuing at work. March 31.

REMARKS.—The stallion which supplied the 'virus' for inoculation died of Dourine 6 months later. The infection of the filly-mare was easily tolerated from the commencement and appears to have died out after 2 years duration, recovery being unbroken for 3 years past.

Filly 29.—Seven months old.

1907.—February. Inoculation of trypanosomes, ordinary strain. Feeble health. Periodicity of trypanosomes, and typical symptoms, including knuckling and inco-ordination (March-December).

1908.—Fair health and tolerance (January-July). Relapse, eruption of 'plaques,' eye symptoms, trypanosomes (August-October).

1909.—Normal health and recovery. No relapse or symptomatic event.

1910.—Normal health. Bred to healthy stallion 117 (July 5).

1911.—Normal health. Birth of healthy foal (June 22).

1912.—Normal health to date, (March 31).

REMARKS.—The course of the disease was marked by severe symptoms and failing health for the first year; tolerance and relapse in the second, followed by three years of recovery.

Mare 41.—Twenty years old.

1907.—February 17. Inoculation of trypanosomes, ordinary strain. Typical local symptoms and trypanosome periodicity (June-September).

1908.—Fair health and tolerance (January-April). Relapse, eruption of plaques, eye symptoms, trypanosomes (August-November).

1909.—Normal health. No further symptomatic event.

1910.—Normal health.

1911.—Normal health and unvarying fair condition.

1912.—Normal health to date (March 31).

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REMARKS.—A very similar case of infection and recovery to that of the preceding one, though during the disease period there was not nearly so much disturbance of the general health.

Gelding 43.—Two years old.

- 1907.—April 24. Venous transfusion from Dourine-infected mare 36. Typical symptoms of Dourine, intermittently (September-December).
1908.—Typical symptoms, including inco-ordination and loss of control (February). Tolerance and returning health (April-December).
1909.—Normal health. Broken to saddle and given steady work.
1910.—Normal health. Used for general saddle work at Quarantine Station.
1911.—Normal health. Tested for long distance riding and range work.
1912.—Normal health to date (March 31).

REMARKS.—This animal is but a pony, but for strength and endurance is found quite equal to the average native pony of this country. The mare from which the transfusion was made eventually died of Dourine. This pony shows a disease period of about 1 year and recovery of 4 years standing.

Filly 69.—Three years old.

- 1908.—August 27. Inoculation of trypanosomes taken from a 'plaque.' Typical local oedemas, with trypanosome periodicity (September-December).
1909.—Typical symptoms—vulvar oedema and depigmentation (January-March). Fair general health. Tolerance and recovery. No symptoms (April-December).
1910.—Normal health. Broken to saddle and given 6 months work. No relapse.
1911.—Normal health. Given range-work and tested for endurance, &c.
1912.—Normal health to date (March 31).

REMARKS.—The disease duration was a short one, only about seven to eight months, though the symptoms were very typical of Dourine. This has been followed by nearly three years duration of recovery and health.

Filly 1f.—Two months old.

- 1908.—July 30. Inoculation of blood from diseased mare 36, Dourine. Fever paroxysms (December).
1909.—January 8. Inoculation of trypanosomes of higher virulence. Fever paroxysms, recurring local swellings, trypanosomes (January-December).
1910.—Fever and paralytic or inco-ordinate actions, intermittently (January-April). Tolerance and return to normal health and conditions (May-December).
1911.—Normal health maintained.
1912.—Normal health maintained to date (March 31).

REMARKS.—A disease period of 1 year and 8 months noted, with recovery now of 2 years standing.

Filly 5f.—One month old.

- 1908.—August 26. Inoculation of trypanosomes taken from a 'plaque.' Febrile period, Oedema of *L. pudendi*, trypanosomes present (December).
1909.—Recurring fever, oedema, 'plaques' and trypanosomes (January-September.) Ill-health, fever, wasting condition and paraplegic symptoms (October-December).

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1910.—Commencing to recover health and condition (March). Last onset of fever (April). Steady progress to health (May-December).

1911.—Normal health and conditions.

1912.—Normal health and conditions, continuing (March 31).

REMARKS.—The course of the disease was very similar to that in preceding case and for the same period of time, namely 1 year and 8 months. No relapse having occurred for nearly 2 years past recovery is indicated.

A. WATSON.

APPENDIX No. 24.

TRYPANOSOMES FOUND IN CANADIAN MAMMALS.

By E. A. WATSON, V.S., AND S. HAWDEN, D.V.SCI.

DEPARTMENT OF AGRICULTURE, CANADA.

(Plates I and II.)

Since 1906 trypanosomes have been found in ten species of mammals by officers of the Health of Animals Branch.

Only one of these parasites has been proved to be pathogenic, *i.e.* that of Dourine.

As will be seen by referring to the plates, several of the apparently non-pathogenic forms bear some resemblance to those trypanosomes which are well known to produce fatal diseases.

Other Canadian mammals doubtless harbour trypanosomes and further species will be recorded.

Intense cold seems to have little effect on the range of these parasites, and it is interesting to note that virulent outbreaks of Dourine have occurred in places where the thermometer sometimes drops to 50° and 60° F. below zero. However, the identity or the non-identity of this trypanosome with that of African Dourine remains open to question, and, on similar grounds, the identity of the African with the so-called Indian and European varieties may well be doubted.

The Dourine of Canada appears to be identical with Beschläuseuche of East Prussia, the Dourine of Hungary and that of Eastern Europe. In any of these, the trypanosome is rarely, if ever, found in the general circulation of infected animals, but only in the serous or sanguineous fluids of local swellings and infiltrations which are characteristic of the malady; further, they closely correspond in that laboratory, animals are notoriously resistant to them, and there are but very few instances recorded of successful infection, in a rat or rabbit, and no investigator seems to have been able to maintain a laboratory strain for any length of time. These trypanosomes, therefore, show a remarkable difference, biologically, from the parasite of Algerian or African Dourine, which is said to be observable in the general circulation of infected horses, and has been transmitted to and carried along in dogs, rabbits, rats, mice, &c., without difficulty, becoming exceedingly virulent for laboratory animals.

TRYPANOSOMA LEPORIS-SYLVAICUS N. SP. WATSON.

(Pl. I., Fig. 1.)

Found in the 'cotton-tail bush rabbit,' *Lepus sylvaticus*, at Lethbridge, Alberta, November 17, 1906. (Watson.)

This trypanosome has been observed in about 30 per cent of rabbits shot or trapped at the Lethbridge Experimental Station, 1906-1911. Blood infection may be noted at any season of the year but the parasites are present in greater numbers and in a greater percentage of animals during the late fall and early winter months than at any other time. They usually disappear from the blood of rabbits held in captivity after a few days, but occasionally persist for a month or longer period.

The trypanosome is 26.7 μ in average length; it differs from the well-known *lewisii* type in being more slender and elongated, in having a more pronounced undulat-

ing membrane, a more centrally situated trophonucleus, and a larger and more rounded kinetonucleus.

This trypanosome is apparently non-pathogenic for native and domesticated rabbits, mice, and pigeons (Watson.)

TRYPANOSOMA PEROMYSCHI N. SP. WATSON.

(Pl. I., Figs. 2, 3.)

Found in northern deer-mice, *Peromyscus maniculatus*, *P. nebracensis*, and other species, Lethbridge, Alberta, December, 1906. (Watson.)

About 20 per cent of these mice are found infected. The seasonal prevalence is similar to that of the rabbit trypanosome. The parasites disappear from the blood of mice held in captivity usually on the second or third day and have never been seen after a period of seven days.

The average length of the trypanosome is 28 μ . The trophonucleus is not so centrally located as in that of the rabbit trypanosome nor as far forward as in *T. lewisi*, and the posterior end of the parasite is narrower than in either of the other two species.

Non-pathogenic for mice and rabbits. (Watson.)

TRYPANOSOMA EQUIPERDUM DOFLEIN, 1901

(Pl. I., Fig. 4.)

The first discovery of the Dourine trypanosome in North America was made at Lethbridge, Alberta, on February 11, 1907, in a naturally infected mare. (Watson and Gallivan.)

Seasonal prevalence: trypanosome periodicity has been noted in horses in every month of the year, not infrequently during the coldest winter months, but the parasite becomes most active, usually, towards the end of a very hot summer season.

Pathogenicity: Different strains of Dourine trypanosomes have been found to vary greatly in virulence. The strain isolated in February, 1907, became exceedingly virulent for horses after eight or nine early passages through young mares and foals.

Dogs, rabbits, mice and gophers were always resistant; white rats were less so, for after a great number of failures to infect with strains of ordinary virulence, a few of these animals were at last successfully infected with the strain which had become so highly virulent for horses, and although the parasites were never seen in the rats' blood, this blood, when injected into horses produced a virulent and fatal infection.

Morphological characteristics: The average length of the parasite is 27 μ . The anterior extremity has a free flagellum, usually of short length; the posterior is frequently blunted or has a sawn-off appearance. The kinetonucleus is very small, smaller than in any of the pathogenic trypanosomes with the exception of *Trypanosoma equinum*, and is frequently associated with, or just posterior to, a vacuole. (Watson.)

"Dourine in Canada." J. G. Rutherford. *The Lancet*, May, 1907.

Special Report on Dourine. *Health of Animals Branch*, Dept. of Agriculture, Canada. Nov. 1907.

"Note on the life-history of *Trypanosoma equiperdum*." E. A. Watson, in *Health of Animals Report*, 1909.

"An Experimental Study of Dourine." E. A. Watson, in *Health of Animals Report*, 1910.

¹ Published by the Department of Agriculture, Ottawa, Canada.

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TRYPANOSOMA CITELLI N. SP. WATSON.

(Pl. I., Figs. 5, 6.)

Found in the ground-squirrel or prairie-gopher, *Citellus richardsoni* (Sabine), at Lethbridge, Alberta, on April 5, 1908. (Watson.)

The blood of three ground-squirrels out of 12 examined (March-July, 1908), showed trypanosomes. Unlike the rabbit and mouse infections, in which the parasites are often plentiful, only one or two parasites could be found in each slide preparation of blood of infected animals.

This trypanosome is $35\ \mu$ in length and has morphological characters that differentiate it from any other species recorded in this paper. Excepting the giant trypanosome of the cow, it is considerably longer and the body of the parasite terminates anteriorly more abruptly, leaving a long free flagellum. The posterior extremity is very slender and finely pointed, the trophonucleus is elongated and well forward, and the kinetonucleus always appears round, never elliptical or rod-shaped.

Non-pathogenic for gophers, mice and rabbits.

TRYPANOSOMA LEWISI (KENT), 1882.

Found in six rats out of 16 examined at Ottawa, Ont., on January 24, 1907. (Hadwen.)

TRYPANOSOMA, SP. BOWHILL, 1909.

From squirrel's blood. Mount Lehman, B.C., Fig. 31, in *Health of Animals Report*, 1909. (Bowhill.)

TRYPANOPLASMA SP. BOWHILL, 1909.

In blood of cow. Mount Lehman, B.C., Fig. 29. 'Red water investigations in British Columbia' in 'Health of Animals Report,' 1909. (Bowhill.)

No description is given of this parasite; it is probably a large trypanosome instead of a trypanoplasma and may be identical with *T. rutherfordi*, described below.

TRYPANOSOMA RUTHERFORDI N. SP. HADWEN.

(Pl. II., Fig. 10.)

A single parasite was found in the blood of a cow at Mount Lehman, B.C., on April 18, 1910. (Hadwen.)

The parasite appears to be non-pathogenic as the cow was fattened later and killed for beef. A rabbit was inoculated with blood but suffered no ill effects. This giant trypanosome, which measures $55\ \mu$ in length, may possibly belong to the *theileri* group. The body of the organism has a broad or stumpy appearance and anteriorly is not finely drawn out as in *T. theileri*, but, on the contrary, terminates somewhat abruptly and has only a very short free flagellum. Posteriorly, a slender filament is extruded from the rounded end of the body. The nucleus is situated posterior to the centre, the endoplasm appears coarsely granular and is profusely vacuolated. No doubt this is an old form of the parasite and probably is at the commencement of degeneration.

TRYPANOSOMA EVOTOMYS N. SP. HADWEN.

(Pl. II., Fig. 7.)

Found in a vole, *Evotomys saturatus* (Rhoads) at Mount Lehman, B.C., on July 7, 1911. (Hadwen.)

A long parasite, average length $26.5\ \mu$, differing from *T. lewisi* in having the nucleus close to the centre, and in possessing a well-developed undulating membrane and a much larger centrosome. The distance between centrosome and nucleus is much

less than in *T. leporis-sylvaticus*, *T. peromysci*, and *T. citelli* (compare with Figs. 1, 2, 3, 5 and 6).

Found in two mice out of ten examined.

Non-pathogenic for two rabbits inoculated July 27, 1911, still alive on September 10, 1911. (Hadwen.) Also non-pathogenic for guinea-pigs. (Dr. McKee.)

Trypanosoma soricis n. sp. Hadwen.

(Pl. II., Figs. 8, 9.)

Found in blood of wandering shrew, *Sorex vagrans*,¹ (Baird) at Mount Lehman, B.C., on July 28, 1911. (Hadwen.)

A short active parasite with the nucleus in centre, undulating membrane well marked, and a very short free flagellum. The organism is broad and stumpy and the total length only 17.5 μ . Found in two out of five mice examined. Apparently non-pathogenic.

We are indebted to Dr. J. C. Rutherford, C.M.G., Veterinary Director General, for permission to publish these notes.

¹These mice were kindly identified by F. Kermode, Curator of the Provincial Museum, Victoria, B.C.

EXPLANATION OF PLATES I AND II.

	Species.	Average length.	Host.
Fig. 1.	<i>T. leporis-sylvaticus</i> n. sp. Watson.	26.7 μ	Rabbit, <i>Lepus sylvaticus</i> .
Figs. 2 & 3.	<i>T. peromysci</i> n. sp. Watson.	28 μ	Mice, <i>Peromyscus maniculatus</i> , <i>P. nebrascensis</i> .
Fig. 4.	<i>T. equiperdum</i> Doflein, 1901.	27 μ	Horse.
Figs. 5 & 6.	<i>T. citelli</i> n. sp. Watson.	35 μ	Ground-squirrel, <i>Citellus richardsoni</i> .
Fig. 7.	<i>T. evotomys</i> n. sp. Hadwen.	26.5 μ	Vole, <i>Evotomys saturatus</i> .
Figs. 8 & 9.	<i>T. soricis</i> n. sp. Hadwen.	17.5 μ	Shrew, <i>Sorex vagrans</i> .
Fig. 10.	<i>T. rutherfordi</i> n. sp. Hadwen.	55 μ	Cow.

[From *PARISITOLOGY*, Vol. V, No. 1, March 12, 1912.]

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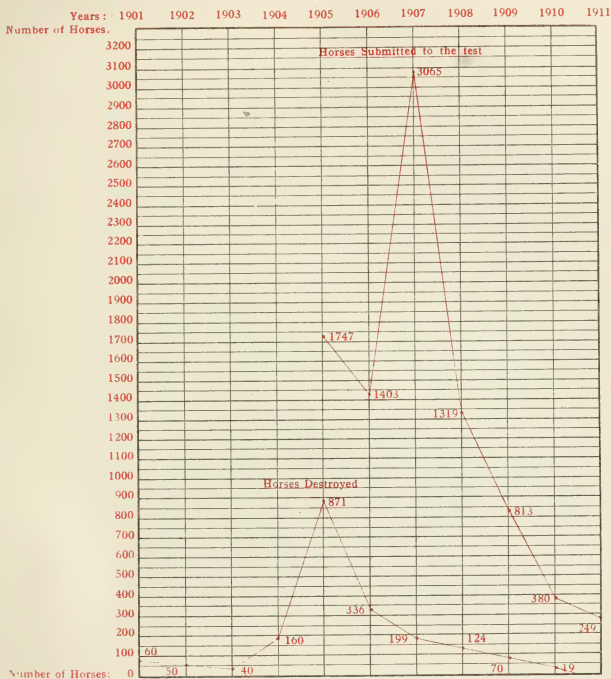
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Before proceeding to consider the use of Mallein and other features in connection with the testing of horses, it would seem proper to furnish reliable statistical information regarding Glanders in Manitoba:—Chart showing number of horses tested with Mallein and number destroyed for Glanders in Manitoba for a period of ten years. Each space on chart represents 50 horses.



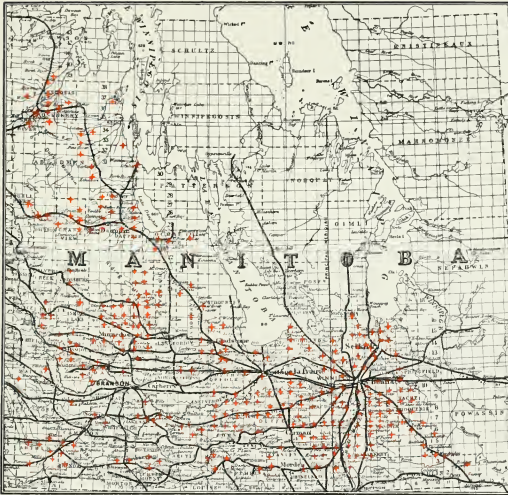
During the years 1901 to 1904 only clinical cases were destroyed. No official records available of number tested.

In 1905 of 1747 horses tested, 871 were destroyed, 365 being clinical cases.

" 1906 "	1403	"	"	336	"	"	173	"	"	"
" 1907 "	3065	"	"	199	"	"	99	"	"	"
" 1908 "	1319	"	"	124	"	"	53	"	"	"
" 1909 "	813	"	"	70	"	"	29	"	"	"
" 1910 "	380	"	"	19	"	"	9	"	"	"

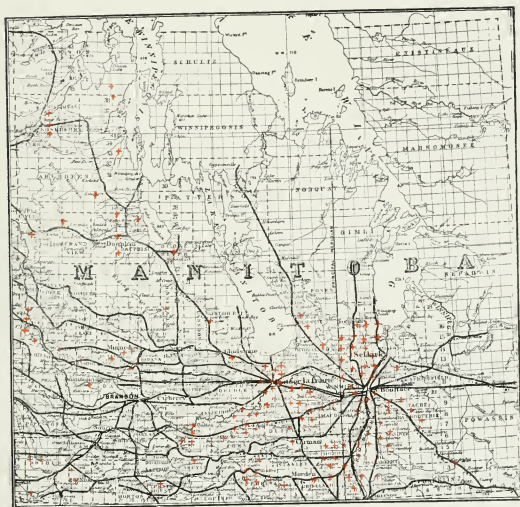
" 1911—249 horses have been tested and up to present time (Aug. 19th) no cases of Glanders have been discovered. In addition to the above, during the above mentioned period extending from 1905 to 1911, we have submitted to the test 14,850 horses and mules entering at boundary points in Manitoba from the United States.

Glanders Outbreaks in Manitoba 1905.



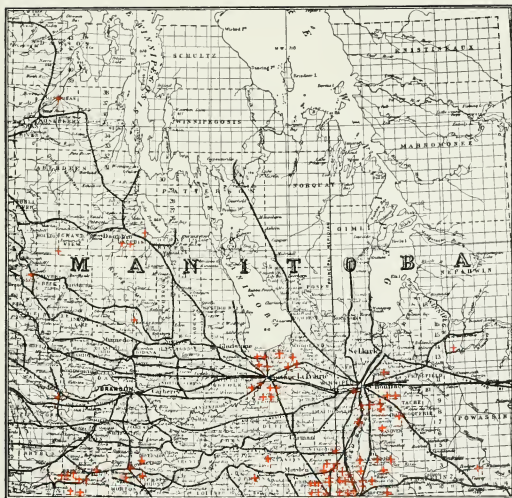
The mark + indicates the location of outbreaks during the year 1905, during this year 1747 horses were tested with mallein, of which 871 were destroyed for glanders, 365 of these being clinical cases.

Glanders Outbreaks in Manitoba 1906.



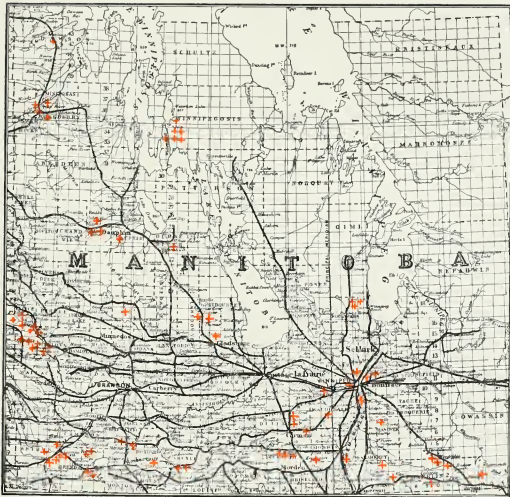
The mark + indicates the location of outbreaks during the year 1906; during this year 1403 horses were tested with mallein, of which 336 were destroyed for glanders, 173 of these being clinical cases.

Glanders Outbreaks in Manitoba 1907.



The mark + indicates the location of outbreaks during the year 1907 ; during this year 3065 horses were tested with mallein, of which 199 were destroyed for glanders, 99 of these being clinical cases.

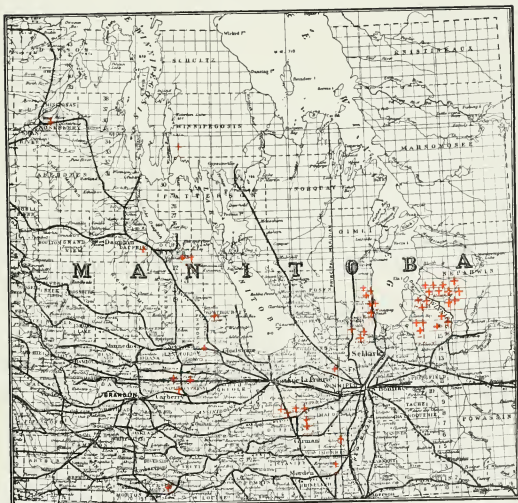
Glanders Outbreaks in Manitoba 1908.



The mark + indicates the location of outbreaks during the year 1908; during this year 1319 horses were tested with mallein, of which 124 were destroyed for glanders, 53 of these being clinical cases.



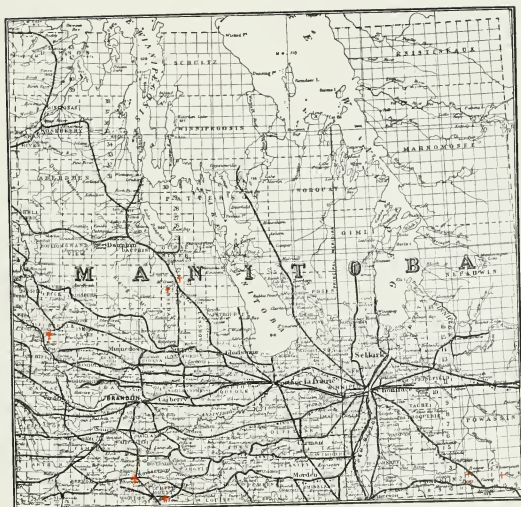
Glanders Outbreaks in Manitoba 1909.



The mark + indicates the location of outbreaks during the year 1909; during this year 813 horses were tested with mallein, of which 70 destroyed for glanders, 29 of these being clinical cases.



Glanders Outbreaks in Manitoba 1910.



The mark + indicates the location of outbreaks during the year 1910; during this year 380 horses were tested with mallein, of which 19 were destroyed for glanders, 9 of these being clinical cases.





No. 1.—The cow shown in the above picture is apparently healthy. She does not cough, her appetite is good, she seems strong and vigorous and gives an unusually large quantity of milk. At the time her picture was taken it was known that she had been tuberculous at least four years and that she had been passing large numbers of tuberculosis germs from her body at least three years. Since it first became known that the cow is diseased she has given birth to four calves.





No. 2.—The cow shown in the above picture is apparently healthy. She does not cough, her appetite is good, she gives a large quantity of milk and is in excellent general condition for a dairy cow. At the time her picture was taken it was known that she had been affected with tuberculosis at least four years and that she had been passing tuberculosis germs from her body at least three years.

The mixed dung of this cow and of the cow shown in the next picture caused tuberculosis in hogs that were permitted to eat it.





No. 3.—The cow shown in this picture is apparently healthy. She does not cough, her appetite is good and her general condition is excellent for a milk cow that as recently calved. At the time her picture was taken it was known that she had been affected with tuberculosis at least $4\frac{1}{2}$ years and that she had been passing tuberculosis germs from her body for a long time. The calf by her side is the fourth she has produced in the last four years. Small quantities of her dung caused tuberculosis in guinea pigs when it was placed under their skin. The mixed dung of this cow and of the one shown in the last picture caused tuberculosis in hogs that were permitted to eat it.

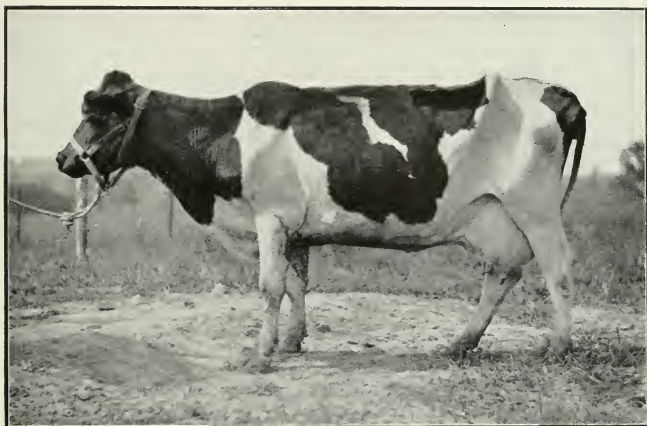




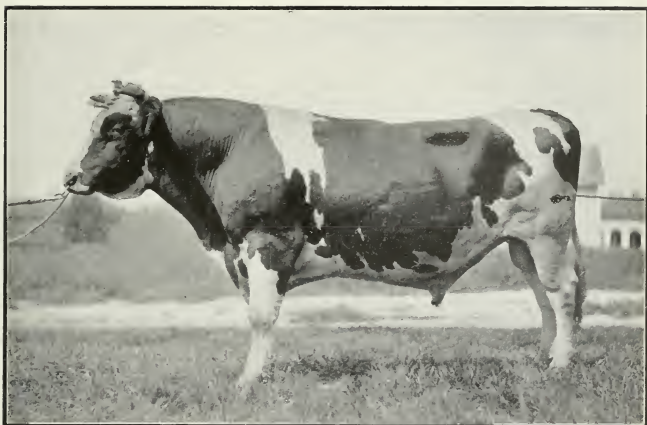
No. 4.—The cow shown in this picture is in excellent condition for an animal that has been affected with tuberculosis more than four years. Three years before her picture was taken tuberculosis germs were found in her dung and hogs that were permitted to eat her dung became tuberculous. About 2½ years before her picture was taken it was found that the milk of the cow contained tuberculosis germs. There was nothing visible about her udder to show that it was diseased and it was only after two months of the most careful tests of her milk that an expert could tell from which of the four quarters the disease germs were being passed.



No. 5.—A long standing advanced case of tuberculosis, with large tuberculous swellings in the udder. A year before the above picture was taken the cow was discovered to have udder tuberculosis. This discovery was made by injecting some of her milk into guinea pigs; there was nothing in the appearance or external condition of the udder at first to show that it was diseased. How very dangerous cows like the one in the picture are may be judged from the fact that calves that are permitted to drink milk from tuberculous udders only a single time are almost certain to have tuberculosis. A small amount of milk from cows like those in the above picture No. 4, mixed with the milk of other cows, will make the whole of it dangerous for both persons and lower animals.



No. 6.—The cow in the picture is an advanced case of tuberculosis. She is very weak and thin, but is a heavy milker and in her weak condition continues to give an abundant quantity of milk. Cows of this kind are unfortunately too numerous in dairy herds. The temptation to keep such cows and to use their milk is greater than some persons can resist. Such cows are a great danger to other animals that may come in contact with them and the use of their milk in a raw state is very apt to cause tuberculosis alike in young persons and lower animals.



No. 7.—The picture of the bull was taken nearly four years after he was first known to be tuberculous and three years after it was known that he was passing tuberculosis germs from his body. Directly after his picture was taken he was killed, and in addition to numerous nodules of tuberculosis in his lungs it was found, when his body was opened, that nearly all the lymph glands connected with his bowels and liver were diseased. At the time of his death the bull weighed 1,850 lbs., and his apparent condition is excellent for an animal that was fed only rough forage and no grain in any form. The presence of tuberculosis in his body would never have been suspected before his death without the help of the tuberculin test.



No. 8.—Sections of a tuberculous udder from a cow. Practically the whole of the udder from which the sections were taken was changed into tuberculous material. Long before tuberculous udders become as badly diseased as the condition shown in the picture the milk contains large numbers of tuberculosis germs and is very dangerous. A tuberculous udder may contain only a single small tuberculous swelling through which the milk becomes dangerously infected with tuberculosis germs.



No. 9.—Sections of tuberculous liver from a cow. The light coloured parts in the picture show the disease.

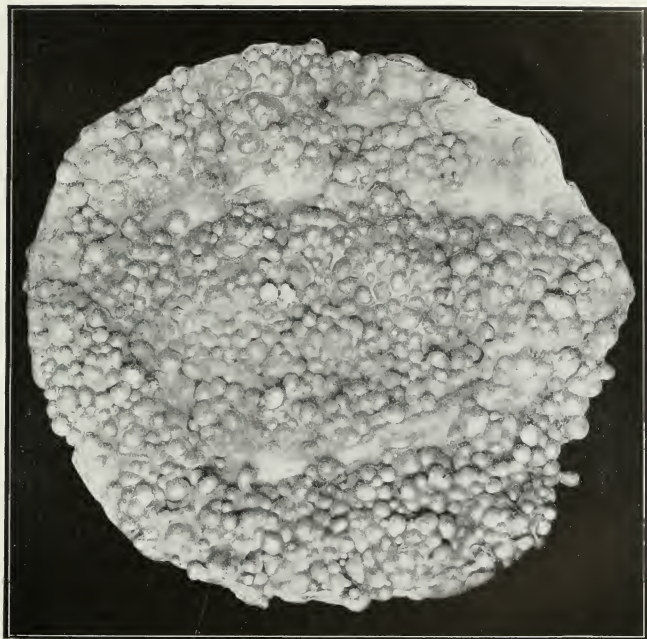


No. 10.—Section of a tuberculous lung from a cow. The picture shows numerous, nearly round tuberculous nodules, one large tuberculous cavity, and several air tubes that extend from tuberculous nodules that are softening and breaking down. When tuberculous nodules in the lungs break down, the material of which they are composed, and which contains millions of tuberculous germs, is coughed up. Some of the germs are sprayed from the mouth and others are swallowed and dis-





No. 11.—Sections of a tuberculous heart from a cow. The light parts are tuberculous. The heart muscle is greatly reduced in volume and is prevented from working properly by the tuberculous material by which it is surrounded. The picture shows how badly an animal may become diseased with tuberculosis before it dies. One reason why tuberculosis is so common among persons and cattle is that many persons and cattle pass tuberculosis germs from their bodies before any one knows or suspects that they have tuberculosis and can give the disease to others.



No. 12.—Tuberculosis of the omentum or caud or the net covering the bowels. This form of tuberculosis is known as Pearl Disease, because the tuberculous tumours look like pearls.



No. 13.—Tuberculosis of the omentum or cul or the net covering the bowels. The picture shows another form of Pearl Disease, in which each nodule is about the size of a grape and is composed of a large number of smaller nodules which have grown together.

PLATE I.



Bladder from cow No. 58 showing submucous hæmorrhages, also eroded patch.

PLATE II.



Ixodes angustus ♂ venter surface.

Photo S. H.

PLATE III.



Ixodes angustus ♀.
Showing shape of capitulum and scutum.

Photo S. H.

PLATE IV.



Photo S. H.

Ixodes angustus.

The capitulum differs markedly from ♂ and ♀. At the base of the palpi two pointed processes are seen, and two auriculæ are seen laterally from the base.

PLATE V.



Photo S. H.

Ixodes angustus L.

Exhibits the difference between ♂ and ♀ much the same as o.

NOTE—For descriptions see Nuttall, Warburton, etc. (Ticks part II),
for life history see page 9 of the article.



PLATE VI.



Hemaphysalis leporis palustris ventral view.

Photo S. H.



Scale 2 inches = 1 mile.

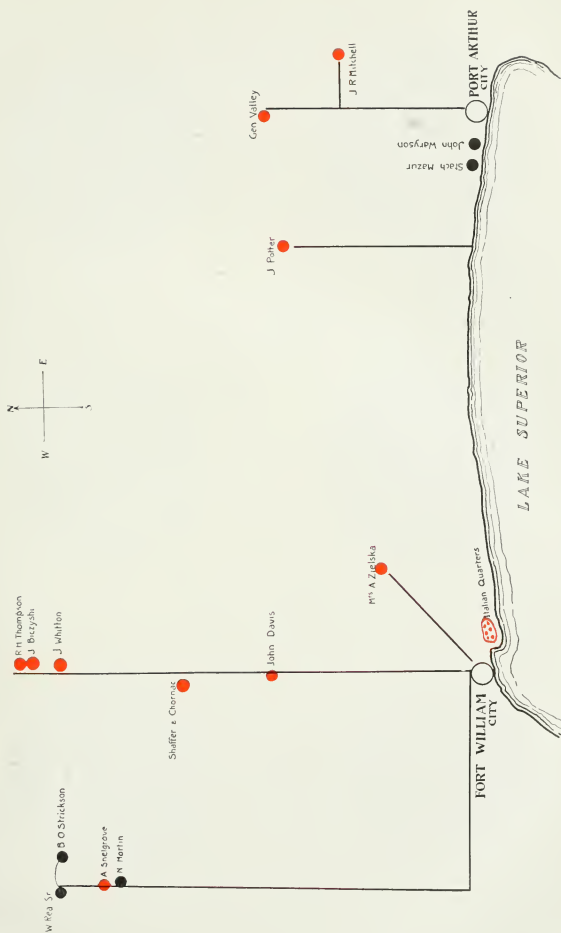


Chart of Hog Cholera infections from uncooked garbage. Page 103.





Fig. 1.



Fig. 2.



Fig. 3.



Fig. 4.



Fig. 5.

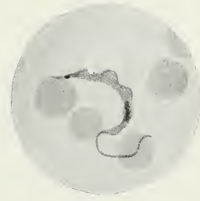


Fig. 6.



Fig. 7.

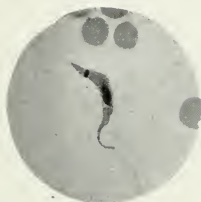


Fig. 8.

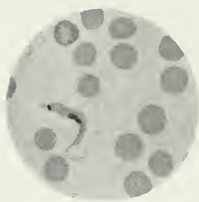


Fig. 9.

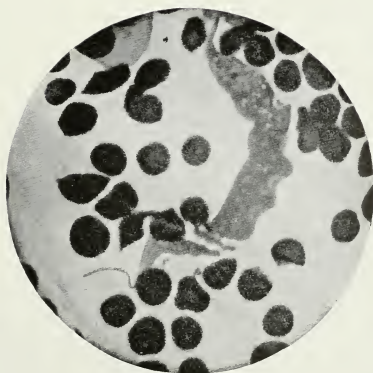


Fig. 10.



